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Area Development Plan For Radio Island

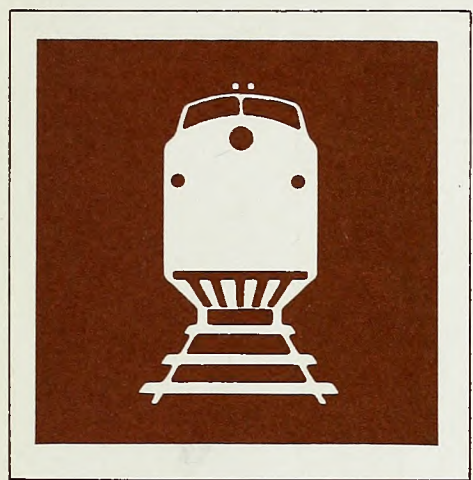
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By
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JUNE 1982

North Carolina
Coastal Energy Impact Program
Office of Coastal Management
North Carolina Department of Natural Resources
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CEIP REPORT NO. 34



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AREA DEVELOPMENT PLAN

for

RADIO ISLAND

prepared for the

RADIO ISLAND TASK FORCE

and the

NORTH CAROLINA DEPARTMENT OF NATURAL
RESOURCES AND COMMUNITY DEVELOPMENT

by

ROBERTS & EICHLER ASSOCIATES, INC.

June, 1982

The preparation of this report was financed in part through a Coastal Energy Impact Program grant provided by the North Carolina Coastal Management Program, through funds provided by the Coastal Zone Management Act of 1972, as amended, which is administered by the Office of Coastal Zone Management, National Oceanic and Atmospheric Administration.

TABLE OF CONTENTS

	<u>PAGE</u>
I. INTRODUCTION	1
II. ASSESSMENT OF EXISTING HARBOR AREA CONDITIONS	4
A. CURRENT UTILIZATION OF WATERFRONT LAND IN THE MOREHEAD PORT AREA	4
B. RADIO ISLAND DEVELOPMENT	10
C. PORT ACTIVITIES	20
D. THE COMMERCIAL AND MARINE RESEARCH INDUSTRIES	34
E. THE TOURISM/RECREATION INDUSTRY	37
F. SUMMARY OF KEY INVENTORY AND ASSESSMENT FINDINGS	38
III. PORT/HARBOR AREA DEVELOPMENT OPTIONS	42
A. ONSHORE SUPPORT FACILITIES FOR OUTER CONTINENTAL SHELF (OCS) OIL AND GAS EXPLORATION AND DEVELOPMENT	42
B. PORT DEVELOPMENT OPTIONS	55
C. RADIO ISLAND DEVELOPMENT OPTIONS	62
IV. RECOMMENDED AREA DEVELOPMENT PLAN	80
A. PORT AREA CONCEPT PLAN	80
B. RADIO ISLAND DEVELOPMENT PLAN	82
C. BUFFERING PORT INDUSTRIAL LAND USES ON RADIO ISLAND	94
D. LOCAL COORDINATING MECHANISMS	98

LIST OF FIGURES

	<u>PAGE</u>
1. GENERAL LOCATION MAP	2
2. MOREHEAD PORT STUDY AREA	5
3. RADIO ISLAND	11
4. EXISTING RADIO ISLAND LAND USES	14
5. MAJOR RADIO ISLAND LAND HOLDINGS	16
6. PREVIOUSLY PROPOSED RADIO ISLAND LAND CLASSIFICATION	18
7. STATE PORTS AUTHORITY PROPERTIES	21
8. SPA PROPERTY HOLDINGS ON RADIO ISLAND	22
9. SPA TERMINAL FACILITIES	24
10. LOCATIONS FOR FUTURE PORT DEVELOPMENT	56
11. CONCEPT SKETCH OF SPA TERMINAL	57
12. PORT AREA CONCEPT DEVELOPMENT PLAN	82
13. FUTURE RAIL AND ROAD ACCESS TO RADIO ISLAND	87
14. A CONCEPT DEVELOPMENT PLAN FOR RADIO ISLAND	90
15. VISUAL IMPACT OF RADIO ISLAND DEVELOPMENT	96

LIST OF TABLES

	<u>PAGE</u>
1. Morehead City Port Tonnages	27
2. Mode of Port Cargo Movement	28
3. Carteret County Seafood Landings	35
4. Dock Values of Seafood Landings	36
5. Land Needs and Employment Impacts Associated with Various Onshore Oil and Gas Facilities	52



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I. INTRODUCTION

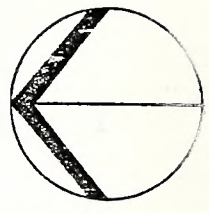
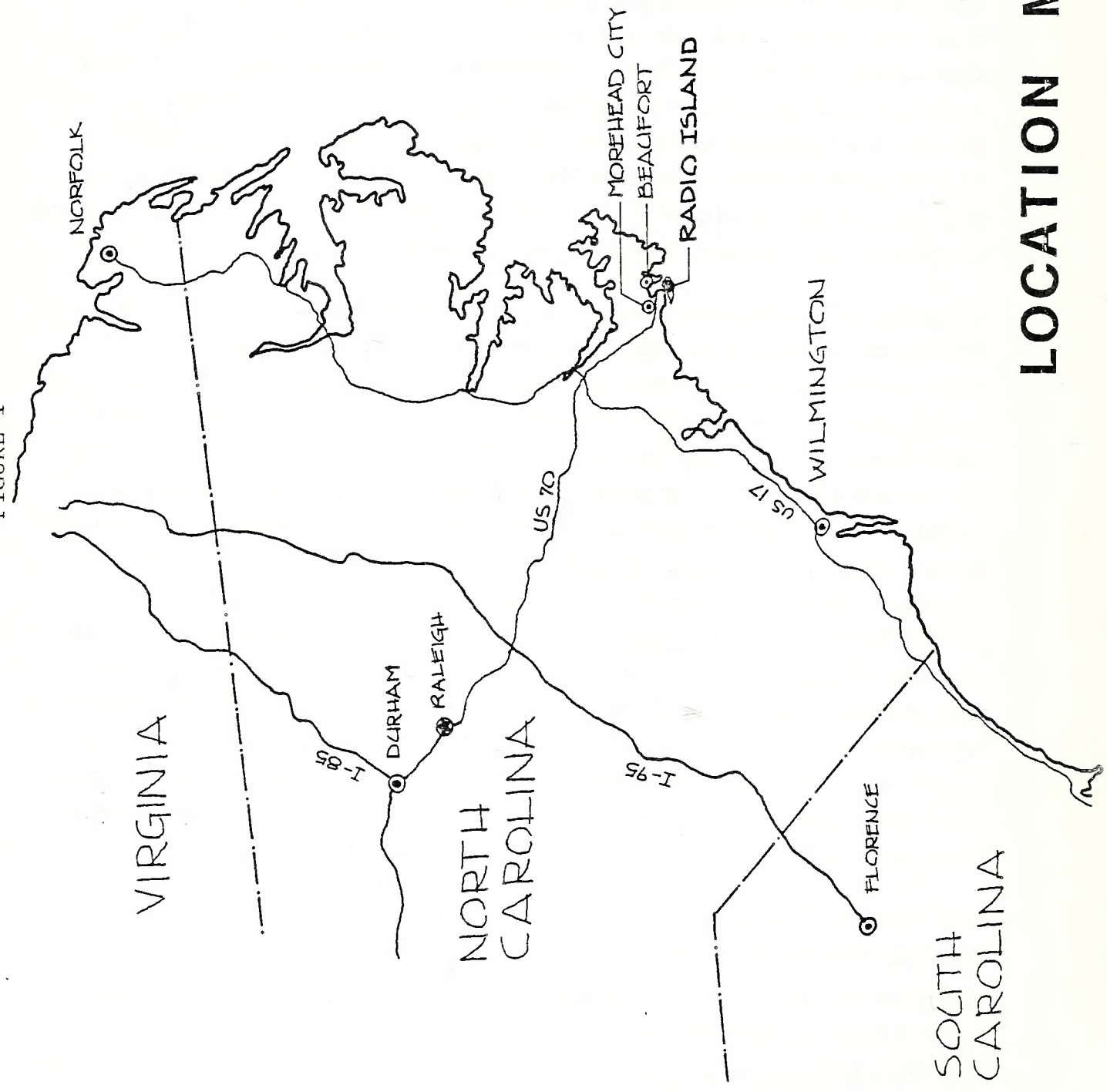
The objective of this project is to prepare an "Area Development Plan for Radio Island" and its environs (the study area is shown in Figure 1). To satisfy this objective it is necessary to:

- (1) identify the different ways in which the available waterfront/port areas in the Atlantic Beach-Morehead City-Beaufort Harbor area are being utilized or could be developed;
- (2) conduct an assessment of the economic, community and environmental impacts that are potentially associated with the various development options;
- (3) prepare an overall concept plan for the development of the port/harbor area that best meets the diverse needs of the region and its residents; and
- (4) prepare specific recommendations regarding the future development of Radio Island.

A number of different ideas regarding the development of the port/harbor area have been proposed and debated over the years. Some of these have evoked considerable controversy. This is not unusual in a coastal environment where economic and industrial development, tourism, commercial fishing and the desires of many permanent residents to continue an established way of life in a relatively stable environment often conflict. The current controversy is over the development of a coal export terminal on Radio Island. However, controversies of this nature can be expected to continue to occur even if the plans for the coal terminal were abandoned until such time as a general consensus on how to use the region's resources and how to resolve conflicting development/conservation objectives typical of a rapidly growing coastal area is developed. This project is intended to provide a policy guide that identifies future growth objectives based on the consideration and balancing of these various interests.

Two interim working papers were prepared as part of the process of developing this final report.

Project Working Paper #1 consisted of an assessment of existing conditions in the study area affecting the future development of the Morehead port area. This paper identified: the way in which



LOCATION MAP

waterfront land is currently utilized; the location of land that is already available or potentially available for meeting future port/harbor area needs; existing harbor and port conditions, including programmed or anticipated improvements and potential port area activities; and other factors that will affect the future development of the port, including the magnitude of commercial fishing, tourism and their support activities. Chapter II of this report contains a discussion of existing conditions in the port/harbor study area.

Project Working Paper #2 presented an assessment of various port development options. The following development options were considered as part of the effort:

- o Various activities that could be located onshore to support offshore outer continental shelf (OCS) activities.
- o Development options and potential uses for the various SPA properties, including Marsh Island, Brandt Island, the SPA Terminal and North Radio Island.
- o Development options for Radio Island, including:
 - More extensive OCS related development than is currently envisioned
 - The proposed re-classification of the Island to "Rural/Port"
 - Retention of the existing "Rural" classification but including additional community type development.

The assessment of the various development options is contained in Chapter III.

Chapter IV presents the recommendations resulting from the analyses undertaken in conducting this project.

II. ASSESSMENT OF EXISTING HARBOR AREA CONDITIONS

A. CURRENT UTILIZATION OF WATERFRONT LAND IN THE MOREHEAD PORT AREA

A primary objective of this study is to develop recommendations concerning the most appropriate future use of potentially developable lands in the Morehead port/harbor area. Figure 2 depicts this study area. The purpose of this section of the report is to describe the physical attributes and current utilization of the major land and water resources in the overall harbor area.

1. Morehead Harbor

The Morehead harbor area consists of a three (3) mile, 42 feet deep ocean channel to the Beaufort Inlet. From the Beaufort Inlet, the Morehead City Channel runs approximately two miles to the State Port Authority (SPA) Terminal. The depth of the Morehead City channel is 40 feet.

The Morehead City channel passes between two major land masses: the eastern end of the Bogue Banks, including Brandt Island and Fort Macon State Park (shown as 1 and 2 respectively in Figure 2) and Radio Island (shown as 3 in Figure 2). The Morehead City channel terminates at the SPA Terminal. A turning basin with a 1,200 foot diameter lies between the SPA Terminal, Brandt Island and Radio Island.

Future expansion of the Morehead City Channel to the north of the SPA Terminal into the Newport River is precluded by: (1) shallow water depths which only permit the handling of barge traffic; and (2) the U. S. 70 bridge between the SPA Terminal and Radio Island, which provides horizontal and vertical clearances of only 65 and 80 feet respectively.

Bulkhead channel borders Radio Island to the east. This 15 foot channel runs from the Morehead City channel on the south, passes Pivers Island and the City of Beaufort

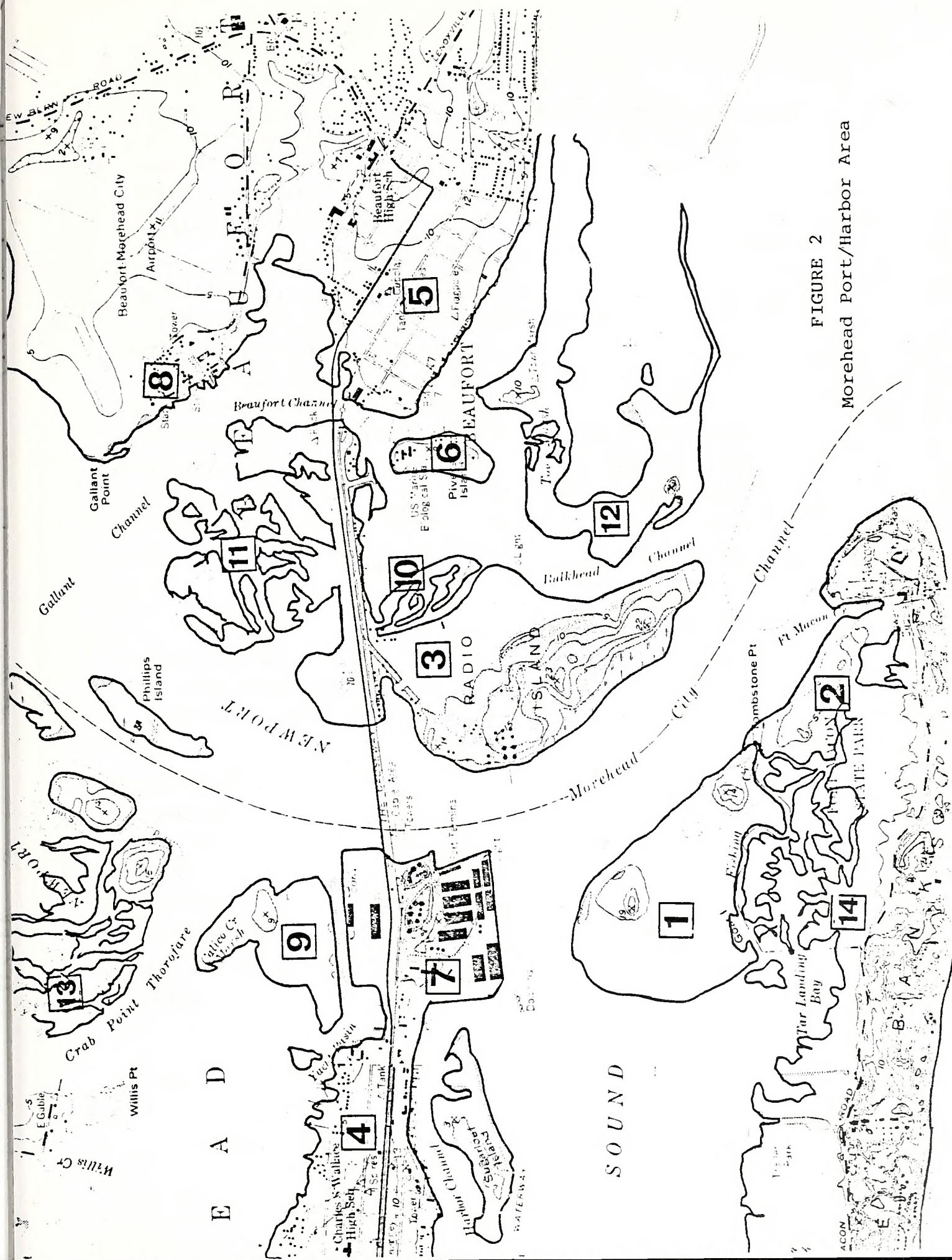


FIGURE 2
Morehead Port/Harbor Area

waterfront area and connects with Beaufort/Gallant channel to the north of the City. It then connects with the Intracoastal Waterway in the Newport River. The prime use of this channel is by research vessels stationed at Pivers Island, by commercial fishing vessels and by sport fishing and pleasure craft.

The Intracoastal Waterway is maintained at a 12 foot depth. It reaches Morehead City from the west via Bogue Sound. At the Morehead City channel, the Intracoastal Waterway turns to the north and heads up the Newport River. Harbor channel provides access to the Morehead City dock area to the west of the Morehead City channel and SPA property. The Intracoastal Waterway is used primarily by fishing and pleasure boats west of Morehead City and also receives heavy barge traffic to the SPA facilities from staging areas upstream on the Newport River.

2. Developed Land in the Harbor Area

There are four land areas in the Morehead port/harbor area that are essentially developed. These are: the towns of Morehead City and Beaufort, Pivers Island, and the SPA Terminal.

Beaufort and Morehead City (shown as 4 and 5 in Figure 2) are relatively small, stable communities of approximately 4,000 population each that have not experienced any significant population growth in recent decades. Most growth in Carteret County has been occurring in unincorporated areas of the County, primarily on the Bogue Banks.

Pivers Island (6 in Figure 2) is a small Island west of Beaufort and east of Radio Island that is devoted exclusively to marine research. The Island houses the Duke University Marine Laboratory and the National Marine Fisheries Service. The SPA property (7 in Figure 2), which is located on the eastern end of the Morehead City peninsular is described more fully in Section C.

3. Partially Developed Land with Further Development Potential

There are two tracts of land in the harbor/port area that are currently only partially developed, but possess significant potential for port related development purposes. These tracts are: 1) the general land area located between the Beaufort-Morehead City Airport and Beaufort/Gallant Channels (shown as 8 in Figure 2). This area is presently underutilized, but part of it is currently being considered as the site of an onshore support base for offshore oil and gas exploration; and 2) Radio Island. Because of its importance to the future overall development of the harbor/port area, Radio Island is discussed separately in Section B of this chapter.

4. Undeveloped Land Potentially Suitable for Port Related Development.

There are two tracts of land in the harbor area that are currently undeveloped but are potentially available for port related development. These are: Brandt Island and Marsh Island (9 in Figure 2).

Brandt Island is located west of the Morehead City channel on the eastern end of Bogue Banks. It has been used as a spoil disposal area, but has just about reached its capacity. The approximately 50 acre tract is owned by the SPA. The island is currently uninhabited and has no highway or rail access. It is bounded on the south by Fort Macon State Park and by Bogue Banks marsh areas. Brandt Island also has been identified as a valuable nesting site for birds along the North Carolina coast. Thus the development of the Island would present some potentially significant environmental problems. However, the Island does have good access to the Morehead City Channel and includes high ground that is suitable for development.

If Brant Island is developed, buffering and screening of storage areas would be of prime importance. This would probably be possible to achieve because of the Island's terrain and high ground.

Marsh Island is a 50 acre spoil dumping ground owned by the SPA which is located to the north of the SPA Terminal property. It is separated from the SPA phosphate handling facilities by Calico Creek. Calico Creek is a dredged channel that is used primarily by pleasure craft transiting from Morehead City to the Intracoastal Waterway.

Marsh Island could be developed for port users either by filling in Calico Creek (and providing access to the Intracoastal Waterway by means of Crab Point Thoroughfare north of the Island) or through the construction of overhead (or possibly underground) conveyor systems that would not interfere with Calico Creek boat traffic but would connect future island facilities to the existing SPA conveyor system. Marsh Island can accommodate only barge traffic or shallow draft vessels.

5. Harbor Areas Not Currently Suitable for Development Because of Environmental Reasons

The protection of the Newport River Estuary is extremely important to the marine and fishing resources of both Carteret County and the State of North Carolina. The wetlands of the Newport River estuary include coastal marshes, intertidal flats and submerged aquatic vegetation. The coastal marshes are the most valued type of vegetation in the estuarine food chain. The marsh areas located in the Morehead harbor/port area which should be protected from potentially negative impacts of port related development are:

- o the 20 acre marsh area to the northeast of Radio Island directly off the U. S. 70 causeway (10 in Figure 2).

- o the 128 marsh area to the north of U. S. 70 on the Causeway (11 in Figure 2)
- o Town Marsh and Bird Shoal/Carrott Island complex (12 in Figure 2). This area has been recommended as the Area of Environmental Concern (AEC) and has been proposed as a National Wildlife Sanctuary.
- o the Newport River marshes (13 in Figure 2)
- o the Bogue Bank marshes (14 in Figure 2)

B. RADIO ISLAND DEVELOPMENT

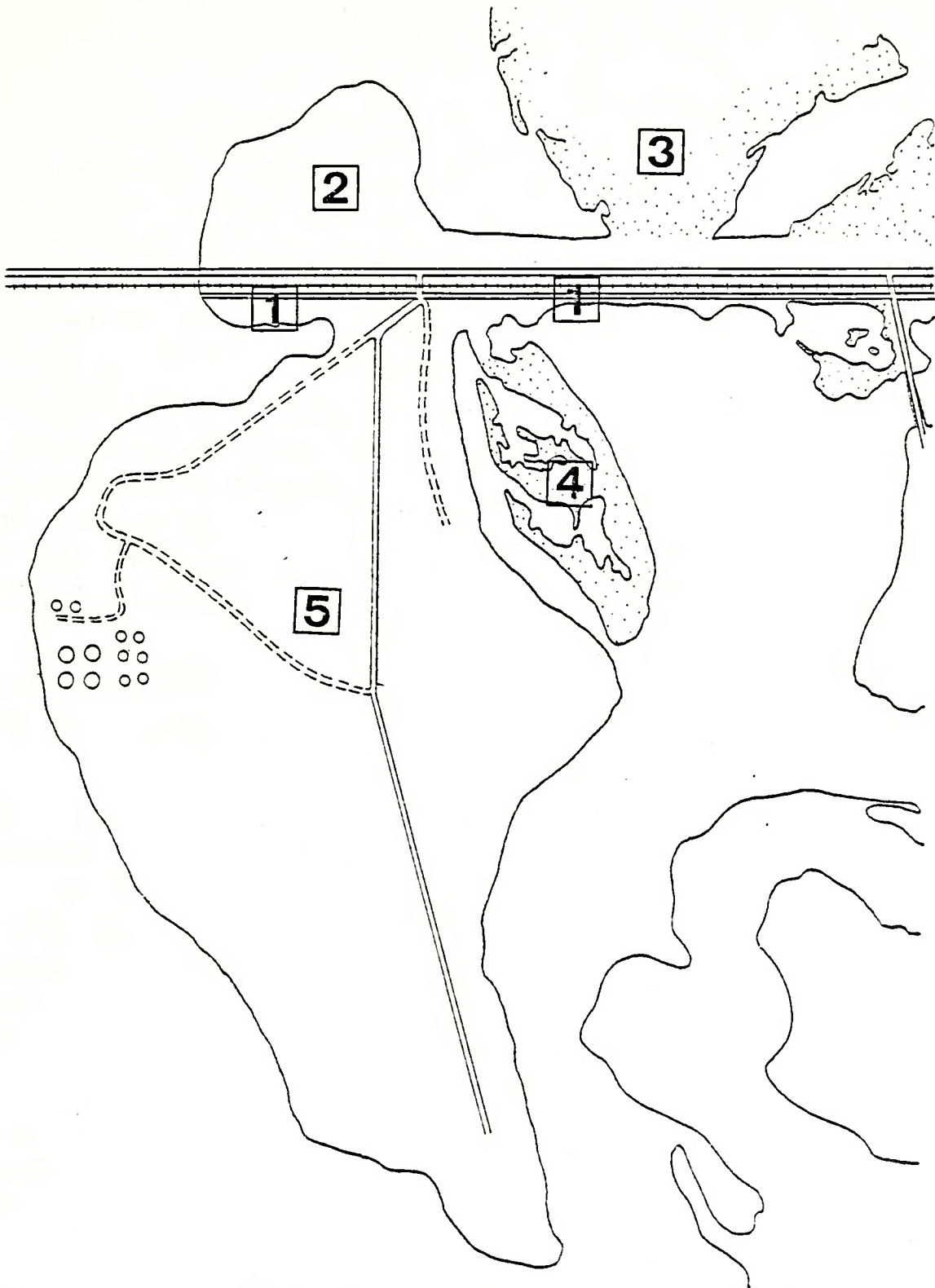
1. The Physical Site

Radio Island was created in 1936 as a spoil area for the initial dredging of the Morehead City channel. Although there is no written documentation, apparently the Island has always been viewed as the natural location for future Morehead City port expansion. The Island is located in unincorporated Carteret County.

Radio Island is somewhat difficult to define. As shown in Figure 3, the Island generally consists of:

- o The causeway area along U. S. 70 between the Morehead City Channel and Pivers Island (1 in Figure 3).
- o A spoil area of approximately 26 acres, which is owned by the SPA, and located north of U. S. 70 (2 in Figure 3).
- o A coastal marsh area of approximately 128 acres to the north of U. S. 70 (3 in Figure 3)
- o A coastal marsh area of approximately 20 acres to the south of U. S. 70 and to the east of the main body of Radio Island (4 in Figure 3).
- o The main body of the Island which consists of an area of about 240 acres (5 in Figure 3).

Most of the main body of Radio Island is suitable for development. The following exceptions were noted in the report titled "Coal Export in North Carolina" prepared by the North Carolina Department of Natural Resources and Community Development: approximately 2 acres of the main body of the island consisting of coastal marsh and about 3 acres of sand flats that lie between the mean high and low water lines. These areas should receive special consideration in preparing future Island development plans. Additionally, submerged aquatic vegetation of significant aquatic value surrounds the Island.



RADIO ISLAND

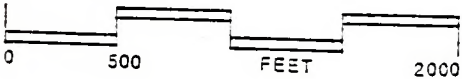
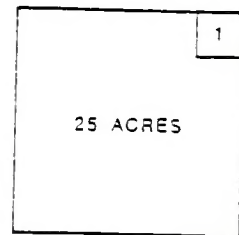


FIGURE 3



2. Existing Land Use

The Radio Island causeway area between the Morehead City channel and Pivers Island is largely developed. Development consists of: 23 houses built as permanent structures, 6 trailers, a marine sales commercial establishment, a restaurant, a body shop repair facility, 4 fish camps, and a grocery store. The amount of vacant land along the causeway is minimal.

The center and southern portions of the Island are undeveloped. A Defense Department road runs the length of the Island and terminates at a large concrete launching pad at the extreme southern tip of the Island. This site is used by the U. S. Department of Defense as an embarkation/debarkation site for its Rapid Deployment Force (RDF).

In addition to the main Island access road, two other local access roads service existing development on the main body of the Island.

A road on the eastern (or Bulkhead channel) side of the Island extends about 1,600 feet and serves six marine related commercial establishments. These include a boatyard, a towing company, a boat building facility and 2 seafood handling facilities. The western side of the road contains only two vacant houses. The tract served by the road is under single ownership, with the land being leased to the businesses.

The road on the western side of the Island provides access to and serves the Aviation Fuels Terminal, Inc. storage facilities, 2 marina facilities, 3 houses (2 other houses have been abandoned and are owned by the SPA) and provides access to land owned by the SPA.

Rail service to the Island is provided by the Beaufort and Morehead Railroad, a short-line railroad constructed around the turn of the century that serves only the Radio Island area.

The southeastern end of the Island near the jetty is a popular spot for swimming and scuba diving. However, this area is neither publicly owned nor maintained.

Utilities are not provided to the Island. Homes and businesses are on individual wells and septic tanks. There are no current plans for providing such services to the Island.

The ownership of the main body of Radio Island is mixed. Eight landowners hold tracts of 5 acres or greater. Five of these tracts are of 20 acres or larger and each has water access.

Figure 4 shows the existing land uses on Radio Island by general land use categories.

3. Radio Island Development Proposals

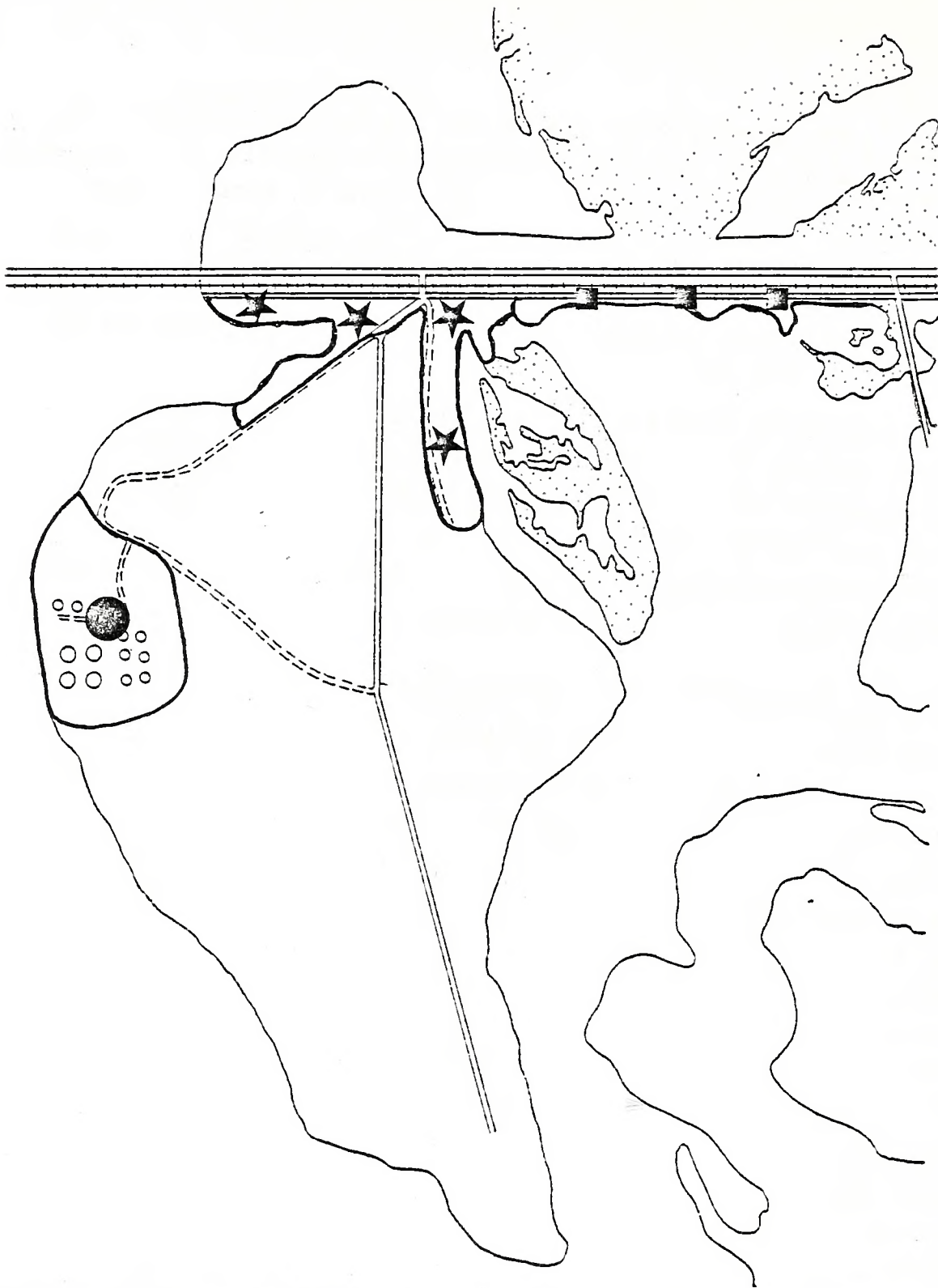
a. Existing Classifications

Radio Island has been zoned "Port-Industrial" by Carteret County since 1962. This reflects the long-standing concept of how this land would eventually be used.

However, the Carteret County Land Use Plan, which was adopted in 1978 by the Coastal Resources Commission, classified Radio Island as "Rural", which is defined as land whose highest use is for agriculture, forestry, mining, and other low intensity uses. This classification is generally inconsistent with the existing use of the Island and with the uses that its various property owners have proposed.

b. Development Proposals of Major Land Owners

There are five major landowners of the main body of Radio Island. These five (5) owners control almost



RADIO ISLAND

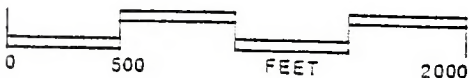
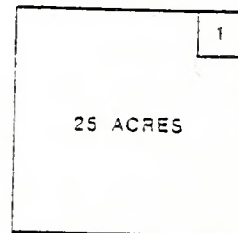


FIGURE 4
Existing Land Uses

- Industrial
- ★ Commercial
- Residential



200 acres (or about 80% of the main body of the Island) as is shown in Figure 5. The plans of these owners are summarized below.

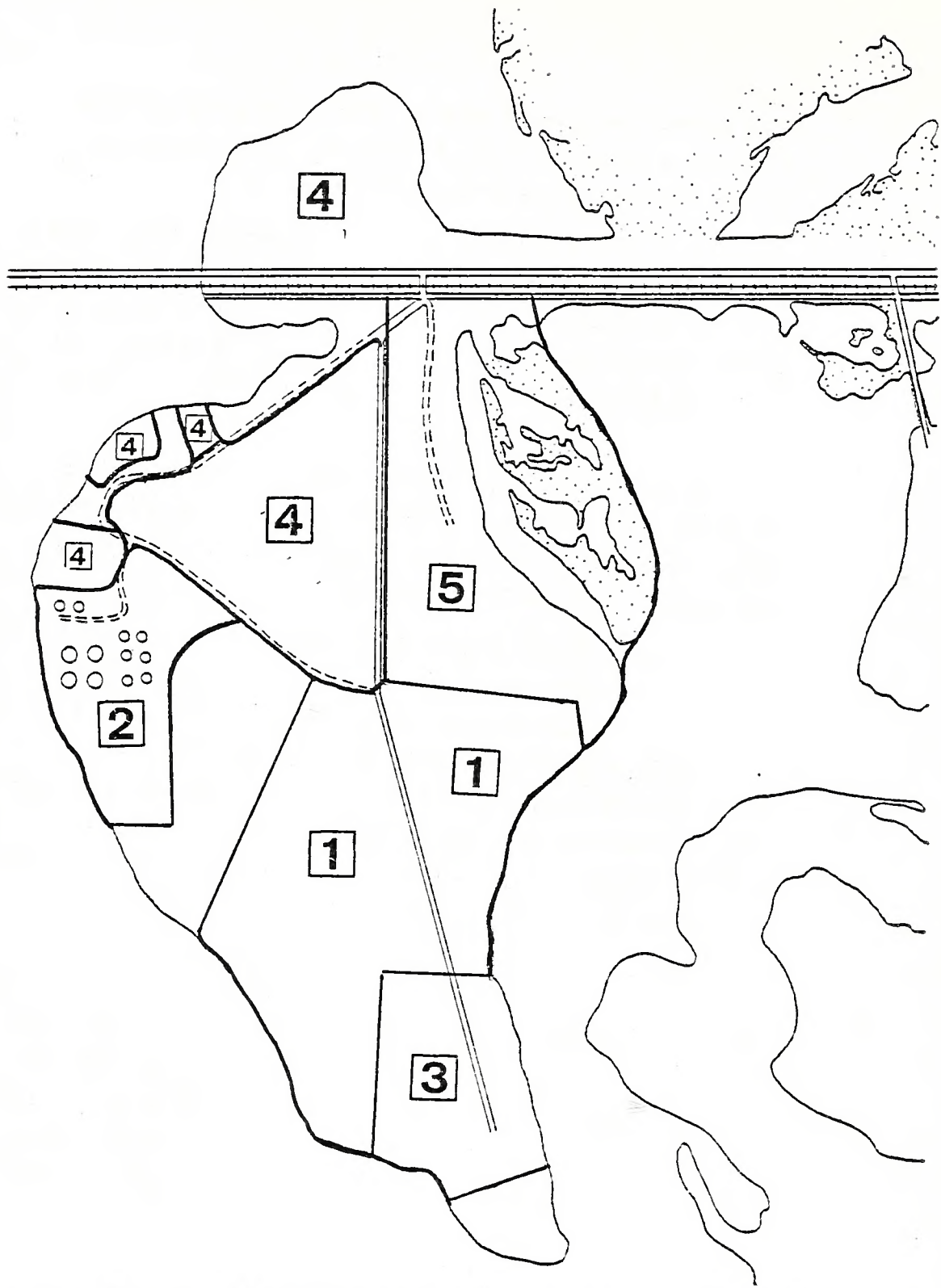
Gulf Interstate owns a 74 acre tract of land with about 2000 feet of shoreline adjacent to the Morehead City channel (1 of Figure 5). Gulf Interstate has proposed to construct and operate a 20 million annual ton coal export facility on this site.

Allied Chemical owns about a 28 acre site which is used as an Aviation Fuels Terminal (2 of Figure 5). About two-thirds of this tract is currently being utilized. Expansion plans are being considered.

Mississippi River Grain Elevator owns approximately 20 acres on the southern end of the Island (3 of Figure 5). The Company plans to utilize its land for grain export possibly through a joint development effort with Gulf Interstate. The Company has also indicated the possibility of utilizing the Bulkhead channel side of its land as a barge docking area for coal and/or grain.

The State Ports Authority owns about 40 acres on Radio Island in 5 different parcels (4 in Figure 5). The largest tract is about 30 acres. This is the area which had been discussed as the site for the expansion of the Alla Ohio Valley Coal Company export facility, which is currently located at the SPA Terminal. The SPA has no specific plans for the use of its Radio Island land except that it should be used for port purposes.

The fifth land owner, a private individual, owns about 30 acres of high land on Radio Island, plus the 20 acre marsh area adjacent to the Island to the east (5 on Figure 5). This owner currently leases the land to businesses for marine oriented



RADIO ISLAND

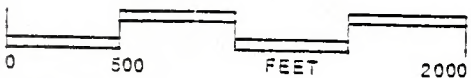
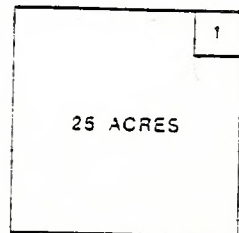


FIGURE 5

Major Land Holdings



commercial enterprises and desires to continue to do so. He has no fixed plans for the inland (currently undeveloped) sectors of his 30 acre tract.

As can be seen from the above discussion, the continued rural classification of Radio Island would be inconsistent with the plans of the Island's major property owners.

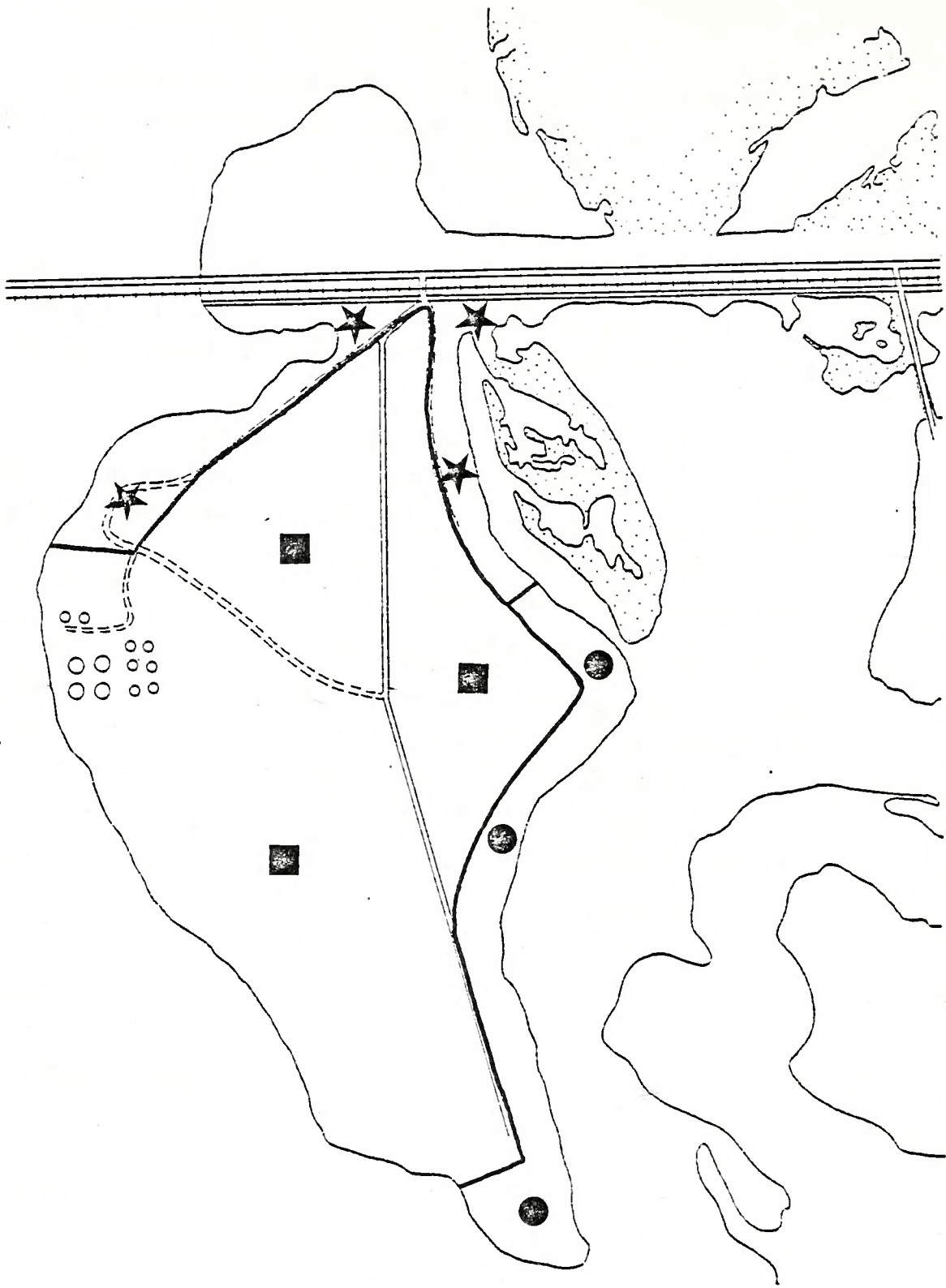
Other proposals expressed at public hearings on the subject of future Radio Island development have ranged from allowing no future industrial development on the Island to the development of the Island as a major tourist/recreational area.

4. State of North Carolina Re-classification Proposal

In 1981, responding to some of the development proposals discussed in 3, the staff of the North Carolina Department of Natural Resources and Community Development proposed the reclassification of the Island with the intent of meeting the following objectives:

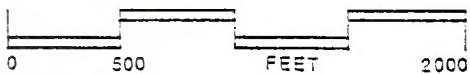
- o Protecting the existing residences and marine related businesses from encroachment of industrial uses.
- o Protecting the area on the southern end of the Island which is used for swimming and diving activities.
- o Protecting the Bird Shoals/Town Marsh complex by providing a buffer on the eastern side of the Island.
- o Allowing water dependent industrial development, but limiting such development to the western side of the Island.

To satisfy these objectives, the reclassification of the Island as is shown in Figure 6 was recommended. However, the North Carolina Coastal Resources Commission decided instead to reclassify the entire Island to "Rural/Port". Under the "Rural/Port" classification, uses would be restricted to port related and light manufacturing uses that are not heavy polluting or dangerous".

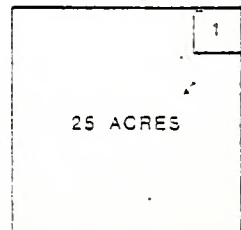


RADIO ISLAND

FIGURE 6



- ★ Community
- Rural
- Rural/Port



Previously Proposed Land Classifications

This reclassification was approved effective July 1, 1982 pending the results of two studies.

- o A plan by the North Carolina Department of Transportation (NCDOT) that resolves rail transportation related issues.
- o An Area Development Plan of Radic Island (represented by this study).

The Carteret County Board of Commissioners has now assumed responsibility for preparing and adopting the required Land Use Plan for Carteret County. Consequently, the County rather than the Coastal Resources Commission will have the responsibility for re-classifying the Island.

C. PORT ACTIVITIES

As described in Section A, the Port of Morehead City operated by the North Carolina State Ports Authority (SPA) is served by the 40 foot deep Morehead City Channel, which includes a 1,200 foot diameter turning basin. The objective of this section of the report is to describe the current facilities and operations of the SPA and the possible expansion opportunities that might be available in the future.

1. Properties Owned by the State Ports Authority

The State Ports Authority owns five major tracts of land in the Morehead City port/harbor area. These tracts as shown in Figure 7 are:

1. The SPA Terminal on the eastern end of the Morehead City peninsula. The SPA does not control and operate all facilities on this tract. Owens Corning owns a portion of the land and the Colonial Oil Company operates its own facilities. Expansion space at the existing site is not available, and the Town of Morehead City is on record as being opposed to any further westward expansion of the port.
2. Marsh Island, a vacant 50 acre spoil disposal area which is directly to the north of the SPA Terminal across from Calico Creek.
3. Brandt Island, a vacant 50 acre spoil disposal area which is located directly south of the SPA Terminal across Bogue Sound.
4. About 40 acres in 5 different tracts on the main body of Radio Island. The largest tract is about 30 acres. SPA property holdings on Radio Island are shown in Figure 8.
5. An unnamed 26 acre spoil disposal area north of the main body of Radio Island on the northern side of U. S. 70 (this site is called North Radio Island in this report).

Following is a summary of the development potential of these five tracts related to the availability of road, rail, and deep water channel access.

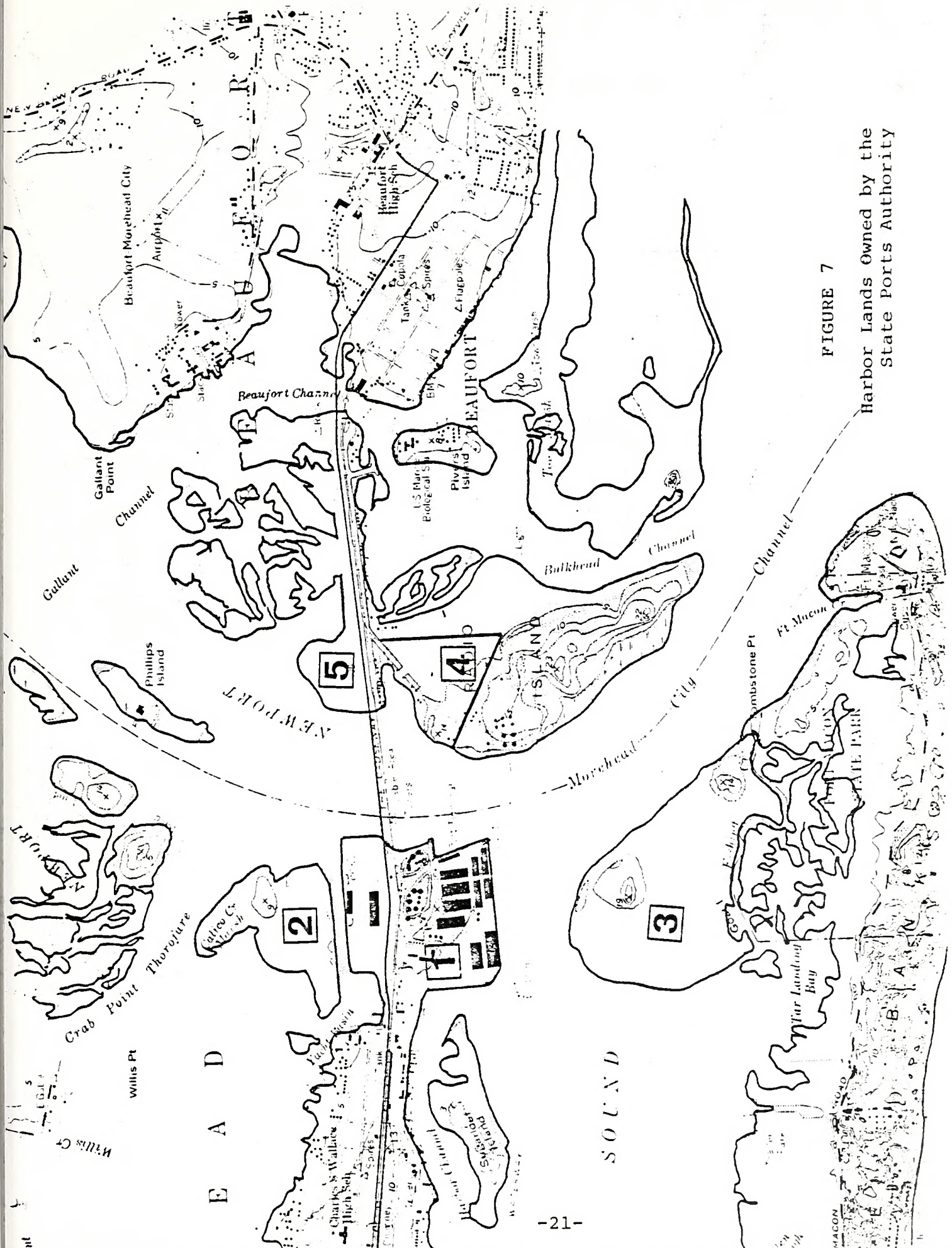
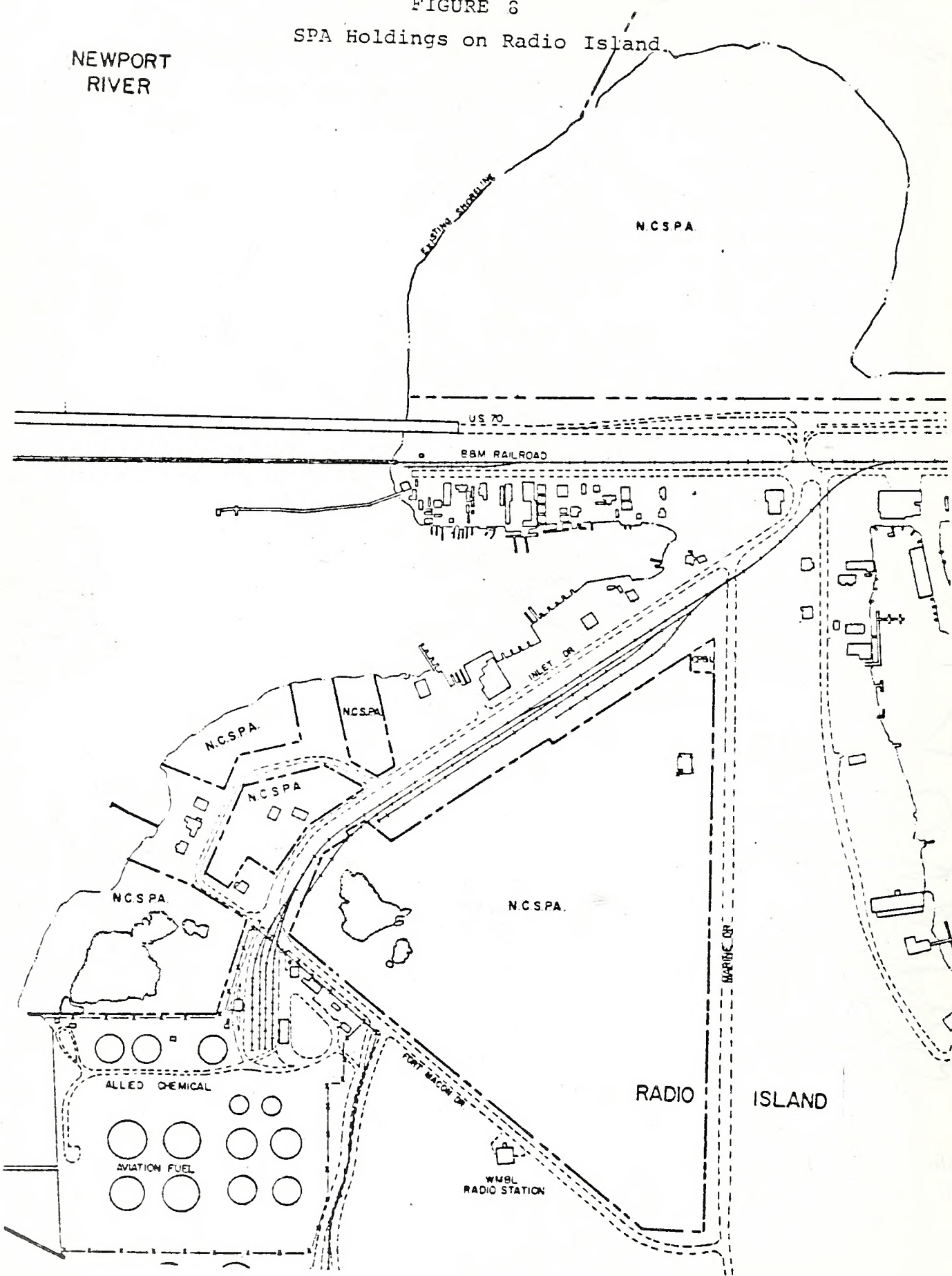


FIGURE 7
 Harbor Lands Owned by the
 State Ports Authority

FIGURE 6
SPA Holdings on Radio Island.

NEWPORT
RIVER



Rail Access

Rail access is available to the SPA Terminal and to the main body of Radio Island. Direct rail access to Marsh Island and North Radio Island could not be provided without constructing additional (undesirable) grade crossings on U. S. 70. Providing rail access to Brandt Island on the extreme eastern end of the Bogue Banks is not a feasible alternative.

Road Access

Direct road access is available to the SPA Terminal, Radio Island and North Radio Island. Direct road access to Marsh Island would be available only by constructing a facility across Calico Creek. Road access to Brandt Island could be provided only if a new road is constructed through Fort Macon State Park.

Deepwater Access

Deepwater access to the 40 foot Morehead City channel is available to the SPA Terminal, to the main body of Radio Island and to Brandt Island. Shallow water channel (12' to 15') access suitable for barge traffic is available to Marsh Island and North Radio Island.

In addition to the tracts owned by the SPA, the only other site in the harbor area that is currently being considered for industrial related port activity is an area on Gallants/Beaufort channel to the west of the airport which is being considered as the site of an OCS onshore support base.

2. State Ports Authority Facilities

SPA currently operates facilities only at its Morehead City Terminal. Figure 9 shows the facilities that are currently located at the Terminal. These available facilities include:

- o 5,300 feet of continuous concrete wharf, including a 1,000 foot berth for bulk cargo handling.

MARSH ISLAND

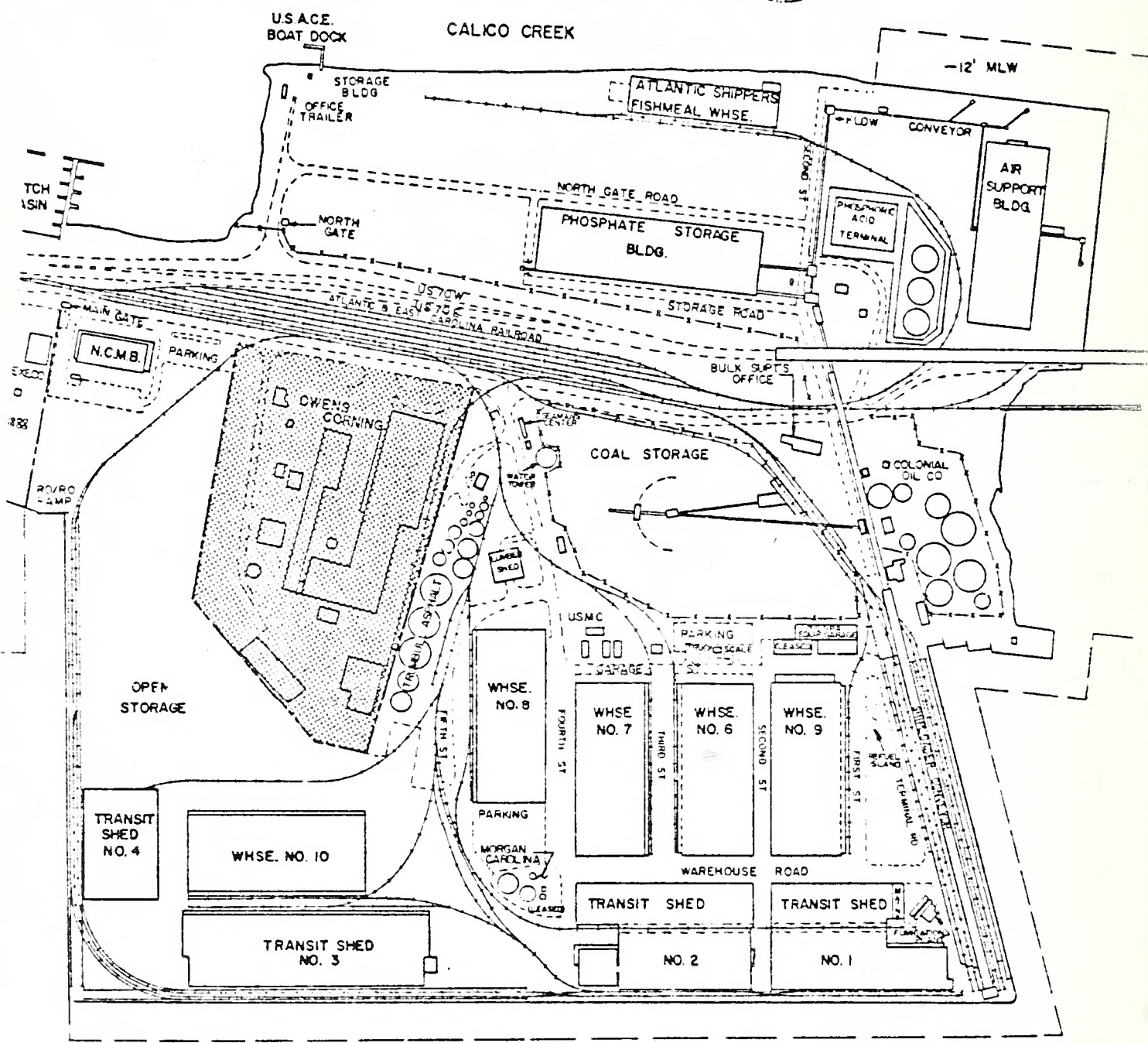


FIGURE 9

SPA Terminal Facilities

- o A barge terminal north of U. S. 70 which consists of 1,200 feet of dock space and provides four 300 foot berths. This facility is currently used for phosphate handling.
- o Four transit sheds with a capacity of 342,500 square feet.
- o Warehouse space totalling 496,550 square feet.
- o Fourteen (14) acres of paved open storage with rail and truck access.
- o A 3 million ton capacity (annual) bulk facility for receiving, storing, conveying, loading and shipping bulk cargoes. The loading capacity is 3,000 tons per hour. Storage capacity is 106,000 tons.
- o A 3 million ton capacity (annual) coal handling facility. The loading capacity is 1,500 tons per hour.
- o Two 115 ton capacity gantry cranes. A container crane was previously available at the facility, but has been removed.

3. Utilization of SPA Facilities

a. Bulk Handling

The terminal bulk handling facilities are currently underutilized. The handling capacity of the system is listed at about 3 million tons per year in the SPA's informational brochure. However, SPA personnel feel that they could probably handle up to 7 million tons per year with their existing equipment. The capacity of the coal handling facility is rated at 3 million tons per year.

In 1981 the tonnage of bulk shipments handled were as follows:

<u>Commodity</u>	<u>Approximate Tonnage</u>
dry phosphate	1,000,000
liquid phosphate	60,000
coal	<u>872,000</u>
	1,932,000

Texas Gulf Sulfur transports phosphate rock, phosphoric acid, and phosphate fertilizer by barge to Morehead City. Typically, eight barges a day with a capacity of 2,000 tons each utilize the facility. Texas Gulf plans to build a small additional phosphates products building to the west of its existing storage building.

North Carolina Phosphate has an option to build a storage building on Calico Creek to the north of the existing phosphate storage facility. It is anticipated that North Carolina Phosphate will barge 3.7 million tons per year through Morehead City, with operations expected to commence in 1984. The SPA expects to be able to handle this increased tonnage with its existing bulk handling facilities.

Coal exportation through Morehead City had been halted by financial difficulties encountered by Alla-Ohio Valley (AOV) Coal Co., Inc. Export operations have now resumed. The existing 3 million ton handling facility was initially considered as possibly the first phase of a larger 12 to 15 million ton export operation, with the larger facility to be located on SPA property on Radio Island. This project is now uncertain.

At this time, the SPA has no firm plans for additional bulk handling other than those described above.

6. Break Bulk Handling

Break bulk exports out of Morehead City basically consist of three products: tobacco, wood pulp products and lumber (primarily yellow pine). In 1982, exports were approximately 182,000 tons, as follows:

<u>Commodity</u>	<u>Tonnage*</u>
tobacco	70,000
woodpulp/paper products	80,000
lumber	23,000
military	9,000
	<u>182,000</u>

*approximate tonnages received from the SPA

Exports of tobacco and wood pulp products are projected to increase by about 10,000 tons each in 1982.

Imports in 1981 totaled about 285,000 tons broken down generally as follows:

<u>Commodity</u>	<u>Tonnage*</u>
asphalt	75,000
bunker 'c' heating oil	179,000
fish meal /tobacco, misc.	<u>31,000</u>
	285,000

*approximate tonnages received from the SPA

Among those break-bulk products that the SPA considers may have potential for import/export out of the Morehead City port are: grain, automobiles, agricultural products and general manufactured goods.

c. Trends in Tonnage Being Handled

The total tonnage handled in 1981 is comparable to that handled during the past three years and significantly exceeds the tonnage handled in the early 1970's. Table 1 summarizes the cargo handled at the SPA Terminal during the past 10 years.

TABLE 1

MOREHEAD CITY TONNAGE HANDLED

<u>YEAR</u>	<u>GENERAL CARGO</u>		<u>ASPHALT & PETROLEUM</u>	<u>MILITARY</u>	<u>GRAND TOTAL</u>
	<u>IMPORT</u>	<u>EXPORT</u>			
1971	374,621.08	472,922.05	291,104.71	7,985.45	1,146,638.29
1972	643,256.80	512,721.68	243,056.23	8,159.17	1,164,697.18
1973	583,895.81	435,697.04	314,788.31	10,090.45	1,029,683.10
1974	538,683.74	559,680.80	252,537.74	5,623.28	1,103,987.82
1975	395,133.36	610,823.58	156,375.39	3,192.84	1,009,149.78
1976	718,409.66	764,535.07	141,388.36	11,594.03	1,494,538.76
1977	160,087.54	871,251.36	708,604.22	4,962.70	1,744,905.82
1978	275,308.36	947,665.29	771,218.42	23,380.97	2,017,573.04
1979	936,372.38	1,170,572.46	331,382.01	5,605.69	2,443,932.54
1980	715,889.75	978,134.47	324,168.31	7,765.06	2,025,957.59

source: N. C. SPA

As can be seen from Table 1, tonnage in the various categories can vary significantly from year to year reflecting

changing demands for different commodities. Table 2 shows the travel modes used to move the cargo listed in Table 1 in and out of Morehead City during the period 1971-1980.

TABLE 2
MODE OF CARGO MOVEMENT

YEAR	MILITARY	NUMBER OF SHIPS		NO. BARGES	NO. OF RAIL CARS	NO. OF TRUCKS
		GENERAL	TOTAL			
1971	37	179	216	203	2,530	5,095
1972	51	208	159	207	1,916	8,301
1973	45	185	120	200	1,949	11,866
1974	38	142	180	268	1,808	13,019
1975	29	134	163	176	2,295	20,622
1976	43	173	216	274	2,249	15,612
1977	27	170	197	335	1,702	16,055
1978	45	155	200	382	1,523	22,223
1979	29	216	245	537	2,358	27,893
1980	31	174	205	428	1,590	32,966

source: N. C. SPA

4. Prospects for Future Port Expansion

In assessing the prospects of future port expansion in Morehead City, three issues appear to be of prime importance. These are: Outer Continental Shelf (OCS) oil and gas exploration; channel deepening; and the limitations imposed on port development by the existing rail system. Each of these is discussed below:

a. OCS Exploration

Exploratory drilling for oil and gas off the North Carolina coast is expected to begin later this year. The Morehead City harbor/port area will be one of the locations for facility bases that will be constructed to support these exploration activities. The initial impact of onshore support bases on local economics and harbor operations is usually minimal.

A number of potential sites for OCS onshore support bases have been previously identified. These include: the SPA Terminal, North Radio Island, Radio Island and the water-

front area to the west of the airport. Support bases require channel depths of 15 feet, about 200 feet of wharfs, 10 acres of flat land and good transportation access. All of these sites potentially satisfy these needs.

The main concern about OCS activities impacting port/harbor activities should not be the establishment of relatively small support bases, but on what could happen in the port area if oil or gas is found or if initial exploratory activities look positive. Either situation could result in a significant influx of marine/harbor related enterprises to the Morehead harbor which could greatly increase port activity and quickly consume available port lands.

b. Channel Deepening

Gulf Interstate has made a preliminary proposal to deepen the Morehead City channel from 40 feet to 58 feet in order to be able to handle the very deep draft bulk coal carriers, which represent a trend in maritime coal export. The Corps of Engineers is currently reviewing this proposal.

There are three general sizes of bulk coal carriers. The smallest of these, the 60,000 ton Panamax size vessel, which can use the Panama Canal, has a draft of 40 feet. About 35% of North American coal export vessels are of this size. Only one U. S. port (Hampton Roads) can accommodate the 100,000 ton coal carriers which have drafts of 48 feet. The 150,000 ton coal carriers require channels of at least 56 feet. The large majority of North American carriers of other bulk commodities and break-bulk carriers can be accommodated in a 40 foot channel.

The major U. S. coal export ports in addition to Hampton Roads are Baltimore, New Orleans, Mobile and Philadelphia. These ports have all recently announced coal export expansion plans. Additionally, Wilmington, Camden, Port Reading, Charleston, Savannah and Brunswick have been considered as locations for new coal export facilities. In total, nearly two dozen U. S. ports have announced plans for new coal export facilities. It can be reasonably assumed that the U. S.

Army Corps of Engineers is not going to finance the deepening of all these harbors to handle 100,000 ton and 150,000 ton coal carriers.

It has been estimated that deepening the Morehead City channel to 58' and extending it approximately 6 miles would cost about \$40 million dollars and would generate about 10,000,000 cubic yards of spoil material.

The issues associated with such a channel deepening project include:

- o environmental effects of dredging and spoil disposal;
- o frequency of maintenance and spoil disposal locations;
- o inlet stability;
- o the impacts on the Newport River, Bogue Banks and Core Sound estuary areas;
- o potential boating hazards;
- o the effect of a new jetty on sport fishing; and
- o project capital and maintenance financing

A channel deepening project would obviously require the preparation of a major Environmental Impact Statement. Additionally, the Corps of Engineers has no current plans to finance the deepening of the Morehead City Channel. Therefore, it would have to be financed privately. Additionally, the Corps would consider financing (or participate in the financing) maintenance dredging of the deepened channel only if there were numerous benefitting users. Consequently, the feasibility of deepening the Morehead City channel to 58 feet at this time appears questionable because:

- o There will likely be no Federal financing of a project of this type.
- o Private financing must be considered very uncertain especially if it entails acceptance of ongoing maintenance and dredging responsibilities. This is especially true in light of recent declines in the demand for export coal.
- o Channel deepening is not needed to accommodate about 35% of the bulk coal carriers operating out of U. S. ports and is not needed to handle other commodities moving in and out of the Morehead harbor.
- o The potential negative environmental and community impacts are uncertain, but could be enormous.

c. Rail Transportation Limitations

In order to get to the SPA Terminal and to Radio Island, a rail train operated by the Southern Railroad must pass through the centers of Morehead City and New Bern. This currently does not present a significant problem because only one train per day goes to and from the port area. This train, which carries aviation fuel, arrives in Morehead City about 5 a.m. and leaves during the late afternoon. Although there are some delays at grade crossings, primarily during the late afternoon, the delays are not that significant.

As can be seen from Table 2 on page 28, commodities coming to and from the port are currently carried primarily by barge and by truck (i.e. Table 2 indicates almost 34,000 truck movements to the port in 1980).

However, if the current situation changes and bulk cargo shipments, such as coal, begin to be carried into Morehead City by train, on both a regular and frequent basis, significant community impact problems could occur.

Coal, for example, would be transported to Morehead City by a unit train (a train hauling only one cargo between fixed origin and destination points). A typical unit coal train would consist of one hundred 100-ton cars hauling a total of 10,000 tons of coal. At an export level of 20 million tons of coal per year, 8 trains would make a round trip through Morehead City every day.

There are a number of problems associated with train movements of this magnitude. These include:

- o Community impacts related to noise, vibration, aesthetics, dust, etc.
- o Potentially serious grade crossing delays. N. C. DOT estimates that it would take a unit train between 7

and 8 minutes to pass through a grade crossing. This would create serious delays at a number of intersections, especially at peak hours, on weekends and during summer months when local traffic volumes are high. The worst delays would be at 24th Street where traffic going to and from the Bogue Banks would be seriously impacted over long periods of time.

It should be noted that community impact and grade crossing problems occur regardless of the commodities being transported, and the extent of such problems are based more on the volume of train traffic rather than the type of cargo being transported.

The Town of Morehead City is on record as opposing additional train traffic through the City. Because of the potentially significant problems, discussed above, two special studies have been undertaken:

Soros Associates has examined alternatives to rail traffic through the City. These alternatives include:

- o A rail/barge system. The unit trains would deposit the coal at a remote yard where it would be subsequently barged to the port (for every 3 million tons handled annually, about 8 daily barge shipments would be required).
- o The use of a marshalling yard to the west of Morehead City, with the final stage of transport to the port being provided by slurry pipeline or some other form of conveyor system.

The results of the SOROS study are not currently available. The second study, which is being conducted by the North Carolina Department of Transportation, is examining the slurry pipeline option and new alternative rail alignments that could be used to provide access to the SPA Terminal and Radio Island but would not go through Morehead City. While the results of this study are not yet available, there appears to be no easy solution.

The Coastal Energy Transportation Study conducted for the North Carolina Department of Natural Resources and Community

Development concluded "That no additional coal terminals be approved in the Morehead harbor until major changes are implemented in the land transportation link for coal inbound to the port. These changes could include a rail bypass, slurry pipeline, conveyor systems, barge service or some combination of systems." Although this conclusion does not represent official State policy it does reflect a valid concern and what many consider to be the major limitation to the future industrial development of the Morehead port/harbor area.

D. THE COMMERCIAL FISHING AND MARINE RESEARCH INDUSTRIES

The commercial fishing industry is extremely important to the overall economy of Carteret County. Data on commercial fishing activities for the past five (5) years have been reviewed. During this period, the County has been ranked #1 in the state of North Carolina in terms of: seafood landings (pounds); dockside value of seafood landings; number of commercial fishing vessels licensed; and in the number of full-time and part-time vessels involved in commercial fishing. The objective of this section of the report is to briefly summarize the importance of the commercial fishing industry to the overall Carteret County economy.

1. Extent of Commercial Fishing Activities

a. Commercial Fishing Vessels and Employment

It is difficult to determine the specific number of fishing vessels in Carteret County that are actually involved in commercial fishing activities on a full-time basis. In 1981, the State estimated (based on 3,927 vessel licenses issued) that the number of vessels involved in commercial fishing activities by category was as follows:

<u>Vessel Use</u>	<u>Number</u>
Full-time Vessels	1,365
Part-Time Vessels	1,482
Pleasure Fishing Vessels	1,080

The estimated number of vessels involved in commercial fishing or full-time vessels was up about 150 from the 1980 estimate.

In the report on "Coal Export in North Carolina," it was estimated that 2,432 full-time fisherman, 2,216 part-time fishermen and 1,547 pleasure boat fishermen were involved actively in commercial fishing in the County. Using a factor of .9 secondary jobs (fishing support activities such as boat construction, supply and maintenance and fish processing) for every full-

time commercial fishing job, it was estimated that about 4,621 persons were involved full-time in the County's fishing industry. This means that over 10% of the residents of the County are involved in the fishing industry on a full-time basis.

b. Seafood Landings

Data on seafood landings by county is maintained by both the state of North Carolina and the National Marine Fisheries Service. Table 3 below compares the data collected on fish landings for the years 1976-1981.

TABLE 3

ESTIMATED LANDINGS
(millions of pounds)

<u>YEAR</u>	<u>STATE OF NORTH CAROLINA</u>	<u>NAT. MARINE FISHERIES SERVICE</u>
1976	27	99
1977	30	127
1978	37	139
1979	47	219
1980	48	181
1981	30	NA

The significant differences are attributable to the fact that the State does not include menhaden landings in its totals (because the small number of seafood dealers involved with this species would tend to reveal privileged information).

c. Economic Value

Both the State and the National Marine Fisheries Service also collect data on the dockside value of the seafood landings. Dockside value refers to the amount paid to fishermen by local fish dealers. These dealers then ship the fish to other distributors for further processing and delivery to customers. Following is a comparison of the two estimates of dockside values for the past five years.

TABLE 4
ESTIMATED DOCKSIDE VALUES
(millions of dollars)

<u>YEAR</u>	<u>STATE OF NORTH CAROLINA</u>	<u>NATIONAL MARINE FISHERIES SERVICE</u>
1976	7	9
1977	8	11
1978	11	15
1979	16	21
1980	19	23
1981	13	NA

It is generally assumed that a local community will receive between 2 and 2.5 times the dockside value of the landings in local income. Using this range and the data on dockside values of the National Marine Fisheries Service (which includes menhaden landings) the economic value of the commercial fishing industry to Carteret County in 1980 was between \$46 and \$57 million dollars.

2. Marine Research

Five marine science and research facilities are located in Carteret County.

These facilities are:

- o National Marine Fisheries Service Laboratory
- o Duke University Marine Laboratory
- o University of North Carolina Institute of Marine Science
- o North Carolina Division of Commercial Fisheries Laboratory
- o North Carolina Coastal Resources Center

Permanent employment is over 250 and the income brought into the County is probably approaching \$10 million annually.

F. THE TOURISM/RECREATION INDUSTRY

Tourism in Carteret County is generally considered to consist of: sport fishing, boating, vacationing, day beach visits and second home (summer homes) development. There seems to be little disagreement that the value of tourism to the Carteret County economy is substantial, but there are disagreements regarding how significant that value is. The Carteret County Economic Development Council (EDC) has estimated travel (tourist) expenditures in the county for at least the last twenty (20) years. The estimates are based on formulas developed by a professor at the University of Tennessee. The EDC's estimated tourist expenditure values for the past five years are shown below.

<u>YEAR</u>	<u>TOTAL TRAVEL EXPENDITURE (in millions of dollars)</u>
1976	11
1977	15
1978	17
1979	17
1980	19

In 1979, the State began a project to estimate tourist related expenditure throughout the State. The State's estimates for Carteret County for 1979 and 1980 were \$62 million and \$69 million respectively. It was also estimated that these values would be low in situations where there is a substantial summer house market (second or summer home development is increasing significantly on the Bogue Banks). The differences between the State and EDC estimates are obviously very significant and it is beyond the scope of this project to resolve them. However, regardless of the actual totals, it is clear that tourism is an important and steadily increasing component of the Carteret County economy.

Among the factors that indicate the importance of tourism to the local economy are:

- o Over 300 local businesses are involved in some form of tourism.
- o Over 2,000 persons are employed by tourist related businesses (estimated based on 1970 trends)

- o Day visitors to the county average about 3,700 during the peak May-August period each year.
- o Overnight visitors to the county average about 15,000 per night during the peak May-August period (an average increase in County population of about 35% during the summer months).

The EDC estimates that the County receives about 1,750,000 visitors per year. If this number is accurate, the average visitor expenditure based on EDC data would be about \$11.00. This appears to be unrealistically low compared to standard tourist expenditure data.

It is impossible to estimate what the economic impact of any industrial development would have on the Carteret County tourist economy. No one can quantify the effect of negative visual impacts (heavy industry intruding on a coastal environment and open space vistas) or the extent to which aesthetic values impact vacation decisions.

Other factors that are important to consider but impossible to quantify (especially in economic terms) are the effects on local residents (as compared to tourists) who also value the coastal town environment and the potential negative impacts on local recreational activities.

F. SUMMARY OF KEY INVENTORY AND ASSESSMENT FINDINGS

Following is a summary of the key findings resulting from the activities that were presented in Working Paper #1.

1. Availability of Land for Port Development

- The amount of land in the port/harbor area both suitable and available for future port related industrial type development is very limited.
- Radio Island because of its size, location, accessibility and access to the deep water channel is by far the best site available for long-term port development.
- Brandt Island is the only other undeveloped land mass with good potential access to the deep water channel. However, its potential is limited by lack of road and rail access. Its best potential port related use would appear to be as a storage area for ship-to-ship or barge-to-ship transfers.
- Marsh Island has good port development potential if bulk commodity shipments by barges increase significantly. The Island can only accomodate shallow draft vessels.
- The potential for North Radio Island for port development appears limited in the short-term. In the long-term, its development, will probably have to be directly tied into port development on the main body of Radio Island.

2. Radio Island Development

- Because of its location and physical terrain, the Island is potentially suitable for almost any kind of development. However, its deep water access makes some form of port related industrial development its best potential use.
- The Island is located in the middle of a highly sensitive and very valuable marine estuary. Any future development of the Island must be sensitive to this environment and should be accomplished through strong enforcement of strict permits.
- The current classification of Radio Island as "rural" is not consistent with its current use, Carteret County zoning, local development plans or economic market realities. It should be changed.
- Existing development along the Causeway could be negatively impacted by future Island development. However, this area already exists in a setting that is industrial

in nature. It has a railroad line immediately to the north; the industrial tank farms on the northern end of the Island; a number of manufacturing type activities on the Island near the Causeway; and is already impacted by odors from fish processing.

- o The use of the southern end of the Island for swimming and fishing is a well established local practice. However, this land is privately owned and is zoned port-industrial. It is not publicly owned, operated and maintained. Potential safety problems due to boat traffic in Bulkhead channel and deep drop-offs close to shore are also significant concerns.
- o The main access road to the interior of the Island is owned (and potentially controlled) by the U. S. Department of Defense. Although Island property owners possess the legal right to use this road, it is still unclear how future operations of the Rapid Deployment Force (RDF) could impact on its use.

3. Port Activities

- o Operations at the existing SPA Terminal, while not at capacity, cannot be substantially expanded because of the lack of land. Increased operations will more likely result from a shifting of uses at the Terminal.
- o The vast majority of cargo movements to the port are by truck and barge. Consequently, until recently the community has never really felt the full impacts of having the port located where it is.
- o The Morehead port is in a rather isolated location, its hinterland is limited and it faces stiff competition from larger ports along the coast. These market factors limit its development potential and are what make a project such as Alla Ohio Valley Coal Co. project so attractive to the SPA. This project could more than double the tonnage moving through the port and substantially increase the port's revenues and profits.
- o Channel deepening from 40 to 58 feet does not appear to be warranted at this time. Its financial feasibility is currently questionable; the existing channel is already adequate for most bulk cargo vessels and for about 35% of the coal carriers operating on the eastern coast; and it could potentially create many significant environmental problems (which haven't yet been fully investigated).
- o A major limiting factor to future port development is the rail access problem. As long as the rail line runs through the center of New Bern and Morehead City, significant increases in its use will have significant,

increasingly intolerable community impacts.

- o Future OCS development beyond just the location of onshore support bases during offshore oil and gas exploratory stage should be looked at as a potentially significant port use. If exploration looks positive, things will change rapidly in the port area and the community must be prepared.

4. Areawide Impacts

- o The importance of commercial fishing activities to the local economy is great. The industry employs a high number of local residents and brings about \$50 million into the local economy annually. Port related industrial activities that pose potentially significant impacts to this resource should be avoided.
- o The importance to the local economy of tourism is not well documented. It is likely of the same order of magnitude as commercial fishing. The potential negative impacts on this industry from improperly planned industrial development cannot be documented, but would probably not be as great as on the commercial fishing industry.
- o Retaining the intangible values called "image" is important to local residents. Important scenic vistas and the coastal village atmosphere should be protected from industrial intrusion whenever possible.
- o The area's economy is based primarily on fishing and tourism. While future industrial development is obviously desirable and important, care should be taken to avoid sacrificing the area's long-term economic base for short-term economic gains.
- o The community impacts (e.g. noise, grade crossing delays, etc.) associated with heavy rail traffic (regardless of the type of commodity carried) could significantly detract from the overall attractiveness of the area in addition to creating disturbances for permanent local residents. None of the alternatives to the current rail alignment look attractive at this time. All would be costly and have significant environmental/community impact problems associated with their construction. Even if a good alternative is identified, it will possibly take at least 3 years to implement.

III. PORT/HARBOR AREA DEVELOPMENT OPTIONS

A. ONSHORE SUPPORT FACILITIES FOR OUTER CONTINENTAL SHELF (OCS) OIL AND GAS EXPLORATION AND DEVELOPMENT

The first sale of OCS leases for oil and gas exploration off the North Carolina coast took place during August, 1981. Additional sales are scheduled for future years. Actual exploration activities off the North Carolina Coast are scheduled to commence within the next twelve (12) months.

Offshore oil and gas exploration (and subsequent development) requires the establishment of significant onshore support facilities and services. Among the factors considered by petroleum companies and their contractors in evaluating particular sites for onshore development are:

- o proximity to offshore activities and to supplies of equipment and materials
- o harbor conditions (all weather channel, sufficient dockside depth and frontage, minimal tide problems, adequate turning basins)
- o infrastructure and services (airport, roads, and rail service to the harbor, water supply, waste disposal facilities, power, telecommunications)
- o developable land (adequate area, slope, stability, and bearing capacity, adjacent or accessible to port facilities)
- o labor force (for construction, for operations, and for support services)
- o ownership of the developable land and the need for parcel assembly
- o the need for zoning changes
- o potential negative social and environmental impacts
- o local policies regarding environmental protection, industrial development and public services.

Source: Outer Continental Shelf Development and the North Carolina Coast: A Guide for Local Planners, North Carolina Coastal Energy Impact Project, 1981

It is expected that up to nine (9) operating companies might use the Morehead port area as the onshore location for servicing their offshore exploration efforts. Three companies (Chevron, ARCO and Gulf) have already either selected or are conducting discussions concerning locating their temporary service support bases in the Morehead port area. Chevron has leased a tract of land on Gallant Channel west of the Beaufort-Morehead City Airport. ARCO and Gulf are discussing base locations at the SPA Terminal. Plans of other potential operating companies are not currently known.

The objective of this section is to discuss the onshore activities that could potentially be located in the Morehead port area.

1. Exploration Phase Activities

A temporary service base is the staging area established by an oil company or independent service contractor for shipping equipment, supplies, and personnel to offshore sites during exploratory drilling. Temporary service bases typically consist of temporary warehousing for dry storage, loading cranes, operations offices, open storage for pipe and casing, drilling mud containers, fuel storage tanks, berthage for the supply boats, and dock space for loading and unloading. Two 200 foot supply boats per drilling rig are usually used to transport pipe, casing, cement, food, fuel, water, drilling mud, hardware and equipment and other supplies to the drilling rigs. Helicopter pads for transporting drilling crews to and from the rigs are also frequently found at service bases. However, it is assumed that the Beaufort-Morehead City Airport would be used for this function rather than a support base.

Temporary service bases are usually located at existing developed harbors. Service bases require about 5 acres of waterfront land for each rig being serviced, year-round ocean access, wharf frontage of 200 feet per rig serviced, an adequate turning basin, navigable channels of 15 to 20

feet, and road or rail access for transport of drilling mud, cement, pipes, fuel and other supplies to the base.

The Coastal Energy Transportation Study conducted as part of the North Carolina Coastal Energy Impact Program (CEIP) identified four potential sites for OCS temporary service bases in the Morehead port area.

- o Marsh Island
- o SPA property on Radio Island
- o The west side of the SPA terminal
- o The northwest corner of the SPA terminal property (adjacent to the phosphate handling facility on Calico Creek).

Radio Island and the westside SPA Terminal sites were ranked highest in the State evaluation. The Marsh Island and northwest SPA Terminal sites were not ranked high because of channel depth problems and the commitment (or potential) to use these sites for increased phosphate or other bulk commodity handling. The CEIP Transportation study did not consider the prospective Chevron site or the other sites on Radio Island that are not owned by the SPA.

The economic impact associated with having onshore OCS temporary service bases located within a community can be significant although they could be of short duration (if the potential for finding economically recoverable oil and/or gas reserves is not identified during early exploration activities),

Based on the experiences of other communities in which service bases have been located, the following type of employment impacts can be expected.

- o Each offshore drilling rig will be manned by two rotating crews totaling about 144 skilled personnel. However, it is likely that a large percentage of these jobs will be filled with out-of-region workers who will not reside in the area even on a temporary basis.
- o About 45 onshore support jobs for each drilling rig in operation can be expected.

- o About one indirect job (a job created to meet the needs associated with the increased population) can be expected for every two direct jobs that are created.

The economic impact on a local economy is generally estimated to range between \$1 and \$1.5 million annually per drilling rig serviced. The type of businesses most likely to benefit from exploration activities are:

- o Supply and catering services for the drilling rig workers - primarily food, linen and paper products.
- o Tool rental
- o Hardware supplies - similar to supplies needed for ships (chain, rope, paint, grease, hardware, etc.)
- o Diving services
- o Fuel, oil and lubrication sales
- o Rig equipment repair, including welding.
- o Shopwork - of the same nature required for shipyard and factory repairs.
- o Transportation services
- o Restaurant and motel services

Given the relatively small scale of onshore support operations, the location of the support bases in areas not frequented by tourists, and the relatively non-polluting nature of support base activities, it can be assumed that support base activities will not have a detrimental impact on tourism. Similarly the commercial fishing industry should not be negatively impacted because environmental problems associated with this type of activity are generally insignificant and the rather low level of boating activity (typically one round trip to each rig per day) should not conflict with commercial fishing operations.

Temporary service bases normally have a positive economic impact on a community and do not create any significant community or environmental problems. However, depending on the location and magnitude of operations they can place additional service demands on local communities,

primarily for water and sewer service and fire protection.

2. Development and Production Stage Support Facilities

Development plans and transport plans (plans for bringing the oil and/or gas to shore by tanker, pipeline or both) will be formulated by the oil companies only if exploration identifies economically recoverable quantities of oil and gas. Although specific onshore facility needs will not be identified until and if there is a recoverable find, such a find would likely result in a scramble for available port/harbor area land that can be utilized to meet the various support, service and development needs that will be created. Consequently, it is important that local communities anticipate this potential demand by identifying those facilities that are appropriate for their area and the onshore land tracts on which such facilities could be located.

Among the facilities that could be located in an area depending on the nature and magnitude of an oil and/or gas find are:

- o Additional Temporary Service Base Facilities
- o Permanent Service Bases
- o Platform Fabrication Yards
- o Pipelines and Landfalls
- o Pipe Coating Yards
- o Platform and Pipeline Installation Service Bases
- o Partial Processing Facilities
- o Gas Processing and Treatment Plants
- o Marine Terminals
- o Refineries

The objective of this section is to discuss these facilities and to generally identify some of the potential benefits and problems associated with them.

a. Additional Temporary Service Bases

As mentioned earlier, there are nine operators that could potentially conduct exploration

activities that would be serviced from the Morehead port area. It is highly unlikely that their exploration activities will occur simultaneously. However, if there is a find (or even positive signs of a find) exploratory activity could increase significantly, thus requiring additional temporary service bases.

b. Permanent Support Bases

A permanent service base provides essentially the same logistical support and services during the resource development phase as the temporary base does during exploratory phase activities. However, the fact that multiple wells can be drilled from one platform and that development and exploration activities will increase significantly after a find means that the size and intensity of required support and services will increase dramatically during development. A service base is typically between 50 and 75 acres in size.

The same factors utilized to evaluate the locations of temporary service bases are important in selecting the site of a permanent service base. A permanent service base requires approximately 200 feet of dock frontage for each platform being serviced, with a minimum channel depth of 15 to 20 feet. Four supply boats and one crew boat will service each platform during development drilling. During production stage activities, each supply boat can usually service two platforms. Good road and/or rail access is essential for a service base because large quantities of drilling mud, cement, pipes, fuel, and other materials must be brought into the base for subsequent transport to offshore platforms.

c. Platform Fabrication Yard

Platform fabrication yards are used for the construction of development phase drilling platforms (offshore oil and gas wells). The size of the fabrication yard is determined, in large part, by the number and complexity of platforms being constructed as well as the number of platform components fabricated on the site.

A platform yard does not have to be sited in the lease region; one yard can service several adjacent lease areas. Platforms are commonly constructed far from the lease area and towed long distances to the site.

Brown and Root (a major platform manufacturer) has purchased 2,000 acres of land in Northampton, Virginia on which it has plans to build a 980 acre platform fabrication yard. This project would

preclude the need for such a facility in the Morehead port area even if there is a major find.

d. Platform and Pipeline Installation Service Bases

If a recoverable oil or gas find occurs, both platform installation and pipelaying companies could establish separate support bases (depending on the transport decisions that are made). These bases are temporary in nature and are usually set up on leased land.

A pipelaying support base requires about 5 acres to support one pipelaying operation and a platform installation base about 5 acres to support four platform installations per year. Storage would occupy most of the sites.

Locational requirements for these service bases are similar to other service bases: at least 200 feet of wharf frontage; a navigable channel of 15 to 20 feet of sufficient width to permit barge maneuvers; and adequate road or rail access.

e. Pipe Coating Yards

As soon as a decision to build a marine pipeline is made the owner of the pipeline will contract for the services of a pipe coating yard. In a pipe coating yard, steel pipe is prepared for underwater use through the application of concrete and asphalt sealers to protect it and to permit it to sink. A pipe coating yard is a large facility characterized by rows of stacked pipe, lanes for forklifts and other mobile equipment, and several low, sprawling structures in which the pipe is prepared and coated. Most existing pipe coating yards are sited at or near the center of oil and gas related industrial activity. If a limited operation is indicated, a portable pipe coating operation (of about 30 acres) may be established. If long-term opportunities exist, investment in a permanent yard (of between 75-200 acres) may be warranted. A site close to the pipe laying service base is preferred,

f. Pipelines and Landfalls

If recoverable gas reserves are found, a marine gas pipeline from the source to the site of the processing plant may be constructed. For gas, proximity to the nearest transmission line is an important influence. If oil is being piped for transshipment, the landfall site will be influenced by the availability of a terminal and tank farm site. Since the decision to build is not made until the nature of the resource can be determined with some certainty, gas is generally reinjected

and oil is transported by barge until pipelines are constructed.

Pipelines will be constructed along a route providing the shortest distance between the find and the processing plant (along routes typically designed to avoid environmentally sensitive areas). A pipeline requires a 50 to 100 foot right-of-way.

There is no reason why a gas pipeline landfall has to be located in a harbor area. An oil pipeline landfall would be located in a port area if a marine terminal was planned to ship the oil to an out-of-region refinery (such terminals typically require a 40 foot channel). A port area oil pipeline landfall would not be needed if the oil is shipped directly to another region from the offshore station or if it were piped to another region via an overland pipeline network.

g. Partial Processing Facilities

Partial processing refers to the separation of oil, gas, water and dissolved or suspended mineral impurities from the petroleum mixture pumped out of the well. A partial processing facility is like a very small refinery, consisting primarily of piping, separation and treatment tanks, and storage tanks for partially processed products.

Partial processing of the well stream can be performed either offshore at facilities on the production platform, or onshore at separate facilities developed for storage or refining. Generally natural gas is removed from the well stream at the platform and handled separately. The partial processing strategy is determined at the same time as platform and transportation decisions are made, after exploratory drilling has confirmed a commercial find. If offshore storage and loading equipment and tankers are used, partial processing is likely to be done offshore. If pipelines are used, partial processing can occur either offshore or onshore.

Because of the location of the Morehead port area at the mouth of the environmentally sensitive Newport River estuary, an offshore location for such a facility if it is required is preferable.

h. Gas Processing and Treatment Plants

If a commercially valuable natural gas find is made offshore, the construction of marine pipelines and one or more gas plants is virtually assured. The technology for liquefying and tankering gas at the platform is currently prohibitively expensive. The

decision to build a gas plant is typically made as soon as the characteristics of the gas supply and transportation and partial processing strategies have been determined.

A gas processing plant is similar in appearance to (although smaller than) an oil refinery. A gas processing and treatment plant is designed to strip impurities and valuable liquefiable hydrocarbons, such as ethane, butane, and propane, from the raw gas stream before it enters the commercial gas transmission line. There are no standard sizes or designs for gas plants; a plant is specifically designed for the gas stream it processes. Gas plants generally have a life of from 10 to 20 years, depending upon the availability of the natural gas supply.

The gas plant must be sited somewhere between the gas pipeline landfall and the closest commercial transmission line. Land availability is the principal determinant of the specific site. Coastal sites, although not necessarily on the waterfront or in a harbor area are preferred by the industries.

i. Marine Terminals

Oil can be loaded onto tankers for shipment to an out-of-region refinery at either an offshore platform or at an onshore marine transshipment terminal where crude oil is received by pipeline from offshore platforms, stored (in tank farms) and then loaded onto tankers for delivery to out-of-region refineries.

The decision to site a marine terminal is made at the same time that production and transportation strategies are determined. If oil produced offshore is loaded directly onto tankers or barges, a marine terminal is unlikely. A new terminal might be developed in the area adjacent to a producing OCS field if the producing fields are so widely scattered that pipelines or offshore storage is uneconomical and refineries are very distant. The most likely case for marine terminal development is a highly productive field (with a long production life) located relatively close to shore (less than 150 miles).

j. Refineries

The modern refinery is a series of processing units designed to produce a number of petroleum products by physically or chemically altering all or part of the crude oil stream. How complex the refinery is depends upon the type of crude oil being refined and the number and kinds of products desired. Refinery sites are often large but with only a small percentage of total area in intensive use. There is

no direct correlation between the discovery of commercial quantities of offshore oil and construction of a refinery in an adjacent area, especially if the OCS area is a reasonable distance to existing underutilized refineries.

3. Potential Development and Production Stage Impacts

No reliable analyses of facilities that will be needed beyond the exploratory phase are possible until the discovery of economically recoverable oil and/or gas resources and the identification of their characteristics. The nature and magnitude of needed facilities will depend upon the volume of recoverable resources, the location and size of the find, the mix of oil and gas, and the nature of the development activities needed to bring the fields into production.

In making decisions concerning the location of onshore oil and gas support facilities, it is important to be aware of a number of decisional factors used by the oil and gas companies.

- o Facilities will be built only if economically recoverable oil and gas reserves are found.
- o Facilities will be designed to satisfy the specific requirements associated with the nature of the resources that will be developed.
- o Support facilities will be located in the Morehead Port area only if it is the most economical location.

It is also important to recognize that onshore service facilities last only as long as the productive life of a field (assuming that there is a find). Specifically,

- o Temporary service bases are usually located on leased land and quickly disappear with little evidence of their existence if economically recoverable reserves are not found.
- o Pipelaying and platform installation support bases and pipecoating yards typically only have short-life cycles and are also usually located on leased land.
- o Activity at a permanent service base decreases

as production starts at the end of the development phase.

- o The most permanent facility likely to be located in a harbor area is a marine terminal and such a facility will be considered only if there is a large find of recoverable oil reserves and if it is more economical to transport the oil to shore for transshipment rather than to transport it directly from the offshore platform.

Table 5 contains a summary of the land needs and employment impacts associated with various onshore oil and gas facilities. With the discovery of an economically recoverable oil and/or gas find, the potential economic benefits, while they cannot even be estimated at this time, would be very significant to the state of North Carolina and to local communities.

Balanced against the potential economic benefits must be potentially negative community and environmental impacts. While specific impacts cannot be identified until development and transport plans are developed, if there is a find, it can be assumed that such impacts would be much more significant during the production stage (the transport of oil and gas to shore and the onshore processing and refining) than they are during the development stage.

The ideal scenario for the Morehead City port area would appear to be as follows: (1) encourage use of the harbor/port area as an onshore service center for offshore drilling activities during the exploration, development and production stages; and (2) discourage the location of production type facilities in the port/harbor area if there is a find. The advantages of such a policy are:

- o Service bases are labor intensive. The location of such facilities in the Morehead port area would result in the creation of numerous temporary construction jobs and permanent service type jobs.
- o The positive economic impact on existing marine related repair businesses and support services would be significant. New businesses compatible with the existing economy of the area would also be expected.

TABLE 5

LAND NEEDS AND EMPLOYMENT IMPACTS ASSOCIATED
WITH VARIOUS ONSHORE OIL AND GAS FACILITIES

FACILITIES	LAND REQUIRE- MENTS (IN ACRES)	AVERAGE NUMBER OF EMPLOYEES	ADDITIONAL EM- PLOYMENT DURING CONSTRUCTION	OFFSHORE EMPLOYMENT
Development Drilling				200 per platform
Additional Temporary Support Base Facilities	5-10 per base	45 per rig		
Permanent Service Base	50-75 per base	50-60 per platform	20-90	
Steel Platform Fabrication Yards	200-1000	250-550	500+	
Concrete Platform Fabrication Yards	Min. of 50 per platform	350-450	600-1200	
Steel Platform Installation Service Bases	5	25		100 (constr.)
Pipelines and Landfalls	40 (for a pump station)	20		250-300 (constr.)
Pipeline Installation Service Bases	5	25		
Pipe Coating Yards	100-150	100-200	3500	
Partial Processing Facilities	15 per 100,000 gal. processed	10	150	
Gas Processing and Treatment Plants	50-75	45-55	500	
Marine Terminals	30	10-90	560	
Refineries	1000-1500	varies signifi- cantly	varies signifi- cantly	

- o The community and environmental impacts associated with support type facilities are not usually significant and are generally manageable. There are specific potential problems that would have to be dealt with, such as the control and disposal of process wastes from pipe coating cards and the disposal of drilling wastes, but such problems can be dealt with through the permit process.
- o Service type facilities while industrial in nature, tend to be unobtrusive. Conflicts with the area's tourism and commercial fishing industries would not be expected to be significant in comparison to other industrial type activities.
- o The Newport River estuary would not be significantly impacted if pipelines, marine terminals, refineries, and other production type processing facilities are not located in the port/harbor area. Such facilities would also have the greatest visual impact. Tourism would benefit if they were located out of the area.

B. PORT DEVELOPMENT OPTIONS

There are five major tracts of land in the Morehead City port/harbor area that are potentially suitable for port related development. These tracts as shown in Figure 10 are:

1. The SPA Terminal on the eastern end of the Morehead City peninsular. Space for only minor expansion is available at the Terminal and the town of Morehead City is opposed to any further westward expansion of the terminal.
2. Marsh Island, a vacant 50 acre spoil disposal area owned by the SPA, which is located directly to the north of the SPA Terminal across Calico Creek.
3. Brandt Island, a vacant 50 acre spoil disposal area owned by the SPA, which is located across Bogue Sound directly south of the SPA Terminal.
4. North Radio Island, a 26 acre disposal spoil area north of the main body of Radio Island across U. S. 70
5. Radio Island, a partially developed tract of about 240 acres (the area south of the causeway). The SPA owns about 40 acres of undeveloped land on Radio Island.

Following is a discussion of the port related development potential of the first four of these tracts (the development options for Radio Island are discussed in Section C).

1. SPA Terminal

Figure 11 consists of a conceptual sketch of the way in which the SPA Terminal area is currently used. As can be seen, the unused or uncommitted space available at the terminal consists of only about 14 acres in open storage on the western side of the terminal property.

The "Coastal Energy Transportation Study" conducted for the North Carolina Coastal Energy Impact Program assessed the SPA Terminal property as the future site of an OCS temporary service base and as the site of a

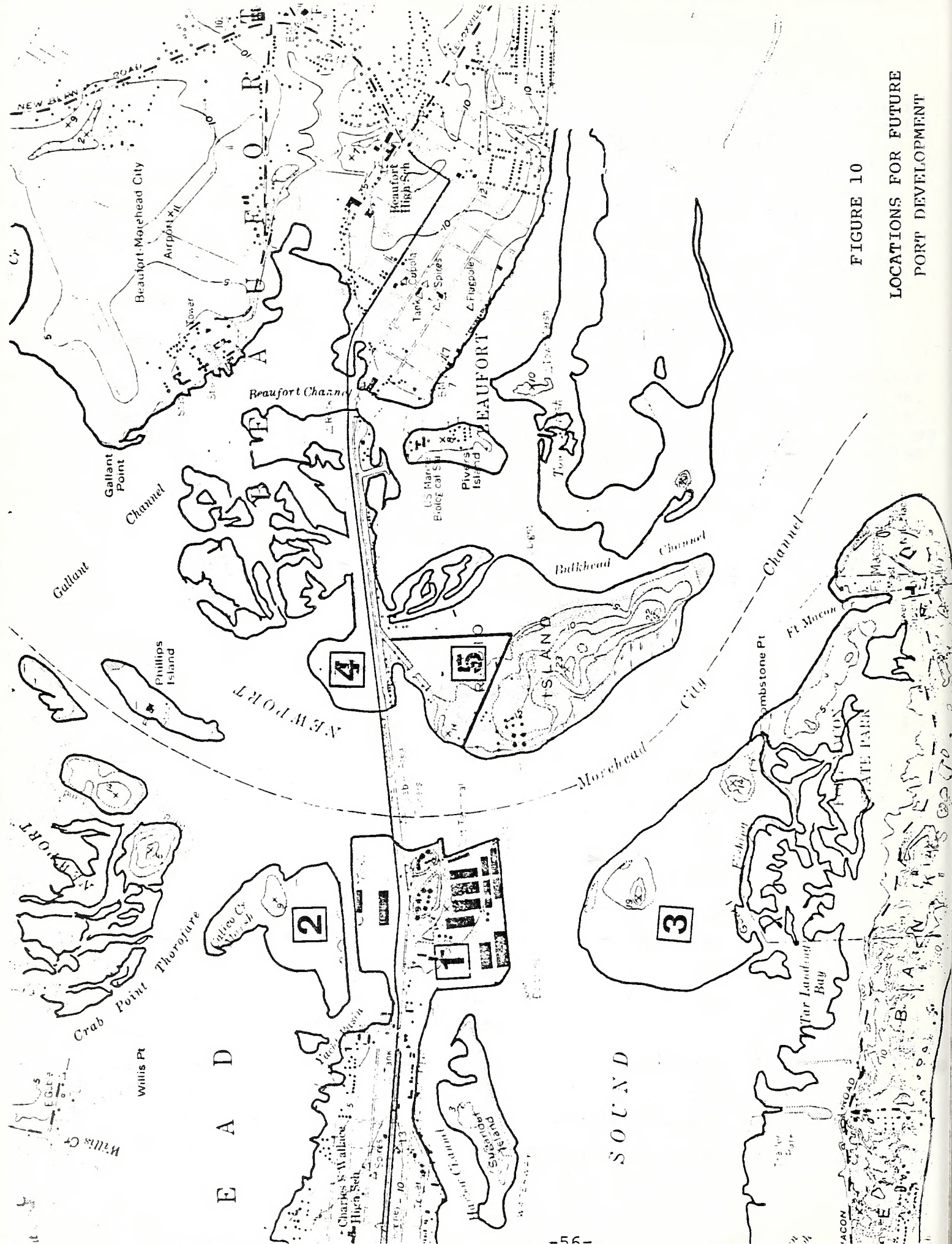


FIGURE 10
 LOCATIONS FOR FUTURE
 PORT DEVELOPMENT

FIGURE 11

SPA TERMINAL USES

////, NOT OPERATED BY S.P.A.

MARSH ISLAND

CALICO CREEK

FUTURE PHOSPHATE HANDLING

PHOSPHATE HANDLING

ADMIN-
ISTRATION

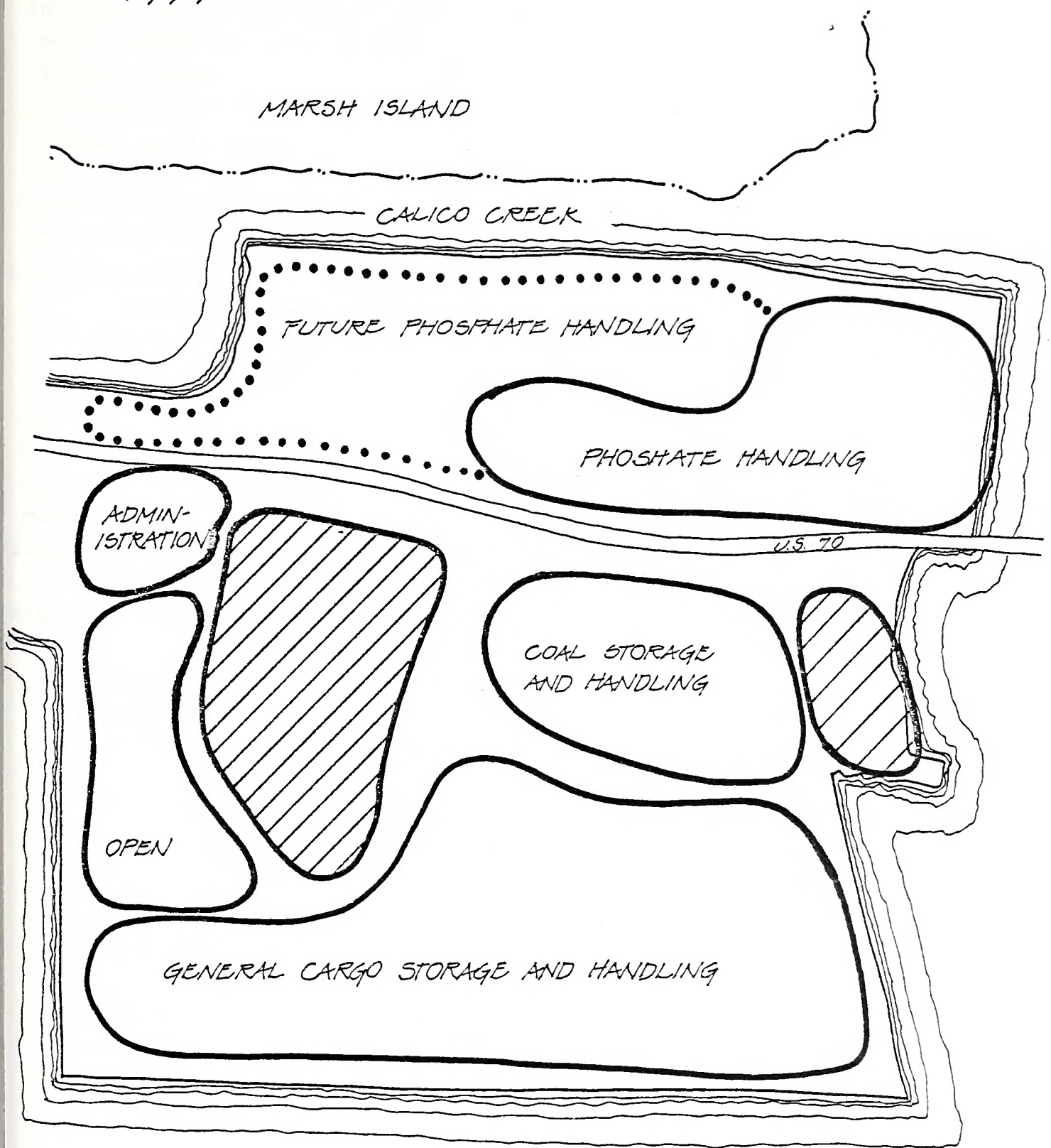
U.S. 70

COAL STORAGE
AND HANDLING

OPEN

GENERAL CARGO STORAGE AND HANDLING

40' Channel



coal export terminal.

The open storage area on the western side of the terminal was the highest ranked site for a temporary service base identified in the Study. The site already meets most of the port and marine service infrastructure requirements of an OCS service base. It has over 1,000 lineal feet of wharf with a 35-foot channel alongside; has good rail and highway facilities into the site; and paved storage areas and nearby warehouses are available along with access to needed utilities and communications. It could be put into operational use without major capital expenditures. This site should be reserved for OCS onshore service and support activities (assuming a negotiated agreement can be reached between the SPA and an oil company operator(s)).

The Alla-Ohio Valley (AOV) Coal facility located on the eastern side of the Terminal was considered as an interim facility by both AOV and SPA. A transfer of export facilities to Radio Island because of expanded operations was envisioned because there is just not enough room available at the Terminal for handling a significant increase in bulk cargo (other than phosphates) unless general cargo handling and storage operations are shifted to another location (i.e. Radio Island) to provide space for such operations.

Our general conclusions concerning the future use of the SPA Terminal are:

- o The area north of U. S. 70 should be reserved exclusively for phosphate handling and storage.
- o The location of a temporary OCS service base on the western side of the terminal should be actively pursued.
- o Although the terminal would be an excellent potential location for OCS onshore service and support activities and for additional bulk commodity handling (that could move to the port primarily by barge), there is not enough space available to accommodate these activities.

- o The SPA should develop a master plan for the future use of its properties. Such a plan should evaluate the economics of options such as shifting general cargo handling operations to Radio Island in the event of a find of recoverable oil or gas reserves off the North Carolina Coast.

2. Marsh Island

The "Coastal Energy Transportation Study" considered Marsh Island as the potential location of a temporary OCS onshore service base and as the site of a coal export facility. The general conclusion reached in the study was that Marsh Island was not a good site for either of these uses because of (1) lack of road and rail access, (2) poor channel access, and (3) potential environmental problems.

Marsh Island can accommodate only barge traffic or shallow draft vessels. It could be developed for port use either by filling in Calico Creek and providing access to the Intracoastal Waterway by means of Crab Point Thoroughfare north of the Island (a longer trip which would cause some inconvenience to boaters) or through the construction of overhead (or possibly underground) conveyor systems that would not interfere with Calico Creek boat traffic but would connect future island facilities to the existing SPA conveyor system.

Our general conclusions concerning the future use of Marsh Island are:

- o It should not be considered for development at this time but rather reserved for future port expansion.
- o Its best potential use is as a site for handling bulk cargoes that are brought to Morehead City by barge.
- o Barge traffic associated with significant increases in phosphate handling will cause increased problems for pleasure craft utilizing Calico Creek. When and if Marsh Island is developed,

the option of filling Calico Creek and providing good pleasure boat access by means of Crab Point Thoroughfare should be considered to be an integral component of the project.

3. Brandt Island

The current lack of (or potential for) road and rail access significantly restricts the development potential of Brandt Island as it is not suitable for general cargo handling or as the location for OCS onshore service base activities.

The Island's potential as the location of handling facilities for bulk commodities transported to Morehead City by barge is limited by: the availability of land elsewhere in the harbor that is better suited for this use (e.g. Marsh Island); and its location on the ocean side of the harbor which would require heavy barge traffic to transit across the harbor, thus creating potential conflicts in the shipping channel.

Our general conclusions concerning the future use of Brandt Island are:

- o It should not be developed at this time, but its location on a deep water channel warrants that it be reserved for possible future, long-term port related use.
- o Problems associated with inadequate access and its harbor location significantly restrict its use for port activities which involve road, rail or barge transport.
- o It should not be considered for development until the development potential of SPA properties at the Terminal and or Radio Island have been fully utilized and unless the potential environmental problems associated with its development can be overcome.
- o Its best potential use at this time appears to be as a storage area for ship-to-ship transfers. The development of such a facility is likely contingent upon receiving designation as a "Free Trade Zone".
- o If Brandt Island is developed, buffering and screening of storage areas would be of prime importance. This would probably be possible to achieve because of the nature of the activities and because of the Island's terrain and high ground.

4. North Radio Island

North Radio Island consists of a 26 acre tract owned by the SPA which is located on the north side of the U. S. 70 causeway across from the main body of Radio Island.

The tract is currently being used as a spoil disposal area. It has no services and no rail access (providing rail access would necessitate a spur across U. S. 70). Road access and access to an unmaintained 15 foot channel are available.

The SPA has no specific plans for the future use of the Island although its channel access gives it potential for either port use or maritime related commercial development. There has been some talk about using the tract as a public beach. This would necessitate some entity purchasing the tract (or a portion of it) from the SPA and then assuming operational responsibility and liability for the safety of those using it. While its use as a beach would offer some conveniences, its best public recreational value could be as the location of a boat ramp and for limited parking. This would necessitate use of only a small portion of the tract.

Our general conclusions concerning the future use of North Radio Island are:

- o Its best potential is for port related or commercial maritime use (the latter option is possible if the land is sold by the SPA).
- o Lack of rail and deep water channel access eliminates its potential as a site for general cargo handling.
- o As a potential bulk handling site, its potential is dependent on being integrated with a future handling facility on Radio Island through some form of conveyor system.
- o Its best short-term potential could be as the site of an OCS onshore service type base.
- o The use of a portion of the tract as the site of a public boat ramp should be explored by Carteret County and the SPA.

C. RADIO ISLAND DEVELOPMENT OPTIONS

The main body of Radio Island consists of about 240 acres. Only a relatively small portion of the Island is developed. Existing development includes:

- o The Aviation Fuel Terminals, Inc. tank storage facilities on the northwest corner of the Island.
- o The Department of Defense embarkation/debarkation facility on the southern tip of the Island.
- o The marine related commercial/industrial business establishments on the northeast corner of the Island.

How the remainder of the Island should ultimately be developed has been the object of considerable debate. The Island has been zoned "Port-Industrial" by Carteret County since 1962. A wide range of industrial uses are permitted within this zoning category. However, the Island is currently classified "Rural" in the Carteret County Land Use Plan which essentially restricts any future development of the Island. These basic inconsistencies should be rectified.

The objective of this section of the report is to identify and discuss options for the development of Radio Island. Three options (which are not necessarily mutually exclusive) are presented. These options are:

- o Industrial/port development of the Island.
- o Concentration of future OCS onshore support facilities on the Island.
- o Retention of existing rural classification, with additional community type development on the Island.

These three development options are discussed in Sections 2, 3 and 4. Section 1 discusses the factors that are of importance in assessing the options.

1. Important Factors in Assessing Future Radio Island Development

In determining the best future use of Radio Island a number of factors should be considered. These factors can generally be grouped into four categories: community impacts; economic impacts; environmental impacts; and transportation system impacts. Concerns within each of these impact categories are discussed below.

a. Potential Community Impacts.

Three types of community impacts are important in assessing Radio Island development options. These are:

- o Areawide Community Impacts. Areawide impacts would be felt beyond the immediate vicinity of Radio Island. The major impacts are those associated with heavy increases in rail traffic through Morehead City and could include: increased noise; increased vibration; significant rail crossing delays; and general community disruption (e.g. on businesses located along the rail corridor).
- o Local Community Impacts. Local impacts would primarily affect those areas in the immediate vicinity of Radio Island. While impacts on existing development located on the Causeway could be significant, it is also important to recognize that the Causeway setting is already industrial in nature. It has a railroad line immediately to the north; the industrial tank farms on the northern end of the Island; and number of manufacturing type activities on the Island near the Causeway; and is already impacted by odors from nearby fish processing.
- o Visual Impacts. Community atmosphere, appearance and community image should be important considerations because of the overall importance of tourism to the area. These values tend to be intangible and the impacts difficult to quantify. However, the retention of scenic vistas and the coastal village atmosphere to the maximum extent possible should be important considerations in assessing Radio Island development proposals.

b. Potential Economic Impacts.

There are four major components of the Carteret County economy that could be affected by future decisions regarding the development of the port/harbor area.

These are:

- o Commercial Fishing. Commercial fishing and related marine support industries are extremely important to the local economy, employing over 4,000 and bringing about \$50 million into the local economy annually.
- o Tourism. Reliable data on the economic impact of tourism in Carteret County is not currently available. However, it is estimated that over 2,000 are employed in tourism related businesses and that the economic value is probably comparable to commercial fishing.
- o Marine Science. Five marine science and research facilities are located in Carteret County. Permanent employment is over 250 and the income brought into the County is probably approaching \$10 million annually.
- o Port Activities. Local data on the impact of port related activities on the Carteret County economy is not available. Employment in and around the port is approaching 300 but not all of these positions are full-time. The SPA's revenue from its Morehead City operations will probably be around \$4 million this year. However, this figure does not reflect the full economic importance of port operations to the State of North Carolina. The SPA estimates that the total economic impact (which includes income from the mining and growing of raw materials and agricultural products, their handling and shipping) is about \$80 for each ton going through the port. With an annual shipping tonnage of about 2.5 million through Morehead City, the total economic impact on the State would be about \$200 million. Neither the accuracy of this estimate or the portion of the estimated total realized locally in Carteret County can be determined from available data.

In addition to the potential impacts on the existing economic base of the area, there are a number of other economic factors that should be considered in evaluating Radio Island development options. These are: the creation (and retention) of jobs; direct impacts on local businesses; public revenues generated; and additional public service and facility costs.

c. Potential Environmental Impacts

This project does not include an assessment of environmental impacts associated with any particular development proposal. The State's position is that potential environmental impacts will be dealt with through established permit review processes and a specific project will be approved only if established standards can be met. However, the magnitude of the potential impacts could differ depending on the type and extent of development permitted on Radio Island. Consequently, at least a general assessment of the potential impacts on the Newport River estuary is important in making development policy decisions.

d. Transportation System Impacts

Transportation system impacts can be of two types: those that affect the capacity limitations of existing rail, water or road transportation systems; and the extent to which the development of port area lands takes advantage of the unique resources that the maintained deep and shallow draft channels represent (i.e. whether the permitted development would be water dependent).

The following sections discuss each of the three Radio Island development options based on a consideration of the above factors.

2. Port Related Industrial Development

There is a current proposal to reclassify Radio Island from "Rural" to "Rural/Port". This proposed classification is defined below.

"Rural/Port: The rural/port classification is used to identify areas that are appropriate for development for port or water-related facilities and that will not require the provision of public service such as water and sewer. Light manufacturing and transportation-related facilities would also be appropriate uses in this classification. Potentially "heavy polluting" or dangerous uses, such as oil refineries or liquified gas terminals, are not appropriate in this land class, but may be appropriate in transition or developed areas where adequate public services are available to deal with their potential problems."

A development proposed for Radio Island must be consistent with both this Rural/Port classification and with the provisions of the Carteret County Zoning Ordinance.

The main body of Radio Island is zoned "Port Industrial" in the Carteret County Zoning Ordinance. It is the only tract of land in the county so classified. Forty-two (42) different uses are permitted in a "Port Industrial" district. Almost any type of industrial use is permitted. There is no requirement that these uses be water dependent. Although many port related uses are listed as permitted uses, dry bulk cargo handling is not one of the 42 uses specifically listed in the ordinance. However, it is assumed that any port related industrial activity could probably be allowed as fitting the intent of the ordinance.

It is our judgement that if Radio Island is re-classified to "Rural/Port" (as is defined above) without modifying the Carteret County Zoning Ordinance it will be extremely difficult to influence (or control) how Radio Island develops or what uses locate there (assuming the required environmental permits can be obtained). This conclusion is based on the following:

- o The proposed "Rural/Port" classification is vague enough to permit almost any use. The definition does not require the use be water dependent and the statement that "potentially heavy polluting or dangerous uses such as oil refineries or liquid gas terminals, are not appropriate in this land class..." is not definitive enough. The term "potentially heavy polluting" is legally vague especially since the objective of the permitting program is to avoid detrimental environmental impacts through the establishment of standards and procedural safeguards. If the permit program works as intended, any industry could argue that its potential for being a "heavy polluter" has been alleviated.
- o The Port Industrial classification of the Carteret County Zoning Ordinance permits many non-water dependent uses and other uses that would not take advantage of a deep channel resource among its 42 permitted uses. The buffering requirement of the ordinance (only a 5 foot vegetation buffer is required) is also inadequate for the type and magnitude of activities that could be located on Radio Island.
- o There is no-site plan review requirement for developments in the Port Industrial zone. Such a requirement would be important for controlling runoff from the tract and for insuring the development of compatible transportation access systems that are designed to efficiently serve the entire Island and not just single developments.

- o There would be no way to legally control the volume of rail traffic through Morehead City. In the case of the existing Alla Ohio Coal terminal facility, the potential volume of rail traffic is controlled through AOV's contract with the SPA. In contrast, if a facility on Radio Island was (1) privately operated, (2) was consistent with the land classification and local zoning and (3) could obtain the required environmental permits, there is theoretically no legal way to limit the number of trains that would run through Morehead City.

- o There is currently no single mechanism for comprehensively reviewing a specific development proposal. This creates potential problems. For example, phosphate barge traffic on the Intracoastal Waterway currently averages about 8 barges per day. When the projected North Carolina Phosphate operation becomes fully operational, barge traffic could easily triple. A rail/barge system for bringing coal to the port area, which has been considered, would increase barge traffic even more dramatically. At one time, it was expected that Gulf Interstate and AOV would combine to export about 30 million tons of coal from Morehead City annually. If barges were used this would amount to 80 barges daily (about 8 daily barge shipments would be required for each 3 million tons handled). Barge traffic of this magnitude would be bound to conflict with pleasure boat and fishing boat use of the Intracoastal Waterway. There is no way under existing control programs to assess problems of this type that are not site specific.

The potential impacts associated with re-classifying Radio Island from "Rural" to "Rural/Port" would obviously vary significantly depending upon the specific projects which locate on the Island. Although impacts could range from minimal to extremely significant, the following discussion is intended to emphasize only the most significant that could occur under present control programs.

Potential Community Impacts

The most significant areawide community impacts associated with Radio Island development would be those associated with increased rail operations. In the past year, two coal export facilities and a grain export facility have been either proposed or identified for Radio Island. Such projects probably represent a worst case example in terms of increased rail traffic because the tonnages moved through the port would increase more than ten-fold. If the existing rail system were used to bring these commodities to the port, the community impacts would be intolerable (and would be much worse than the current assumptions of the North Carolina DOT which are based only on the impacts associated with one of the potential projects). An industrial project which could significantly increase rail traffic through Morehead City should not be approved prior to the development of an alternative transportation solution (consistency with CAMA land classifications and local zoning classifications would essentially constitute local approval under current regulations).

Local community impacts will increase as Radio Island develops regardless of the use of the Island. At a minimum, traffic to and from the Island will increase. At the other extreme certain uses could create environmental nuisances (odor, dust, visual intrusion, etc.) that could significantly impact development along the Causeway. A local mechanism which includes detailed site plan review requirements and more stringent buffering requirements is probably the best approach for addressing this type of problem. Such a mechanism could also be used to address broader community concerns related to community image and visual impacts.

Potential Economic Impacts

Any development on Radio Island will have some positive economic benefits in that some increase in jobs and economic activity would be expected. However, both positive and negative impacts will vary depending on the specific use. Important economic factors concerning port related development of Radio Island are:

- o In terms of creating jobs, port activities related to bulk cargo handling have the least beneficial impact because of the high degree of mechanization. In contrast, port activities related to general cargo handling and other marine service type activities tend to be much more labor intensive and would likely create more jobs.
- o The potential for negative impacts on the marine science and commercial fishing sectors of the local economy is greater for those activities that involve the open storage or handling and transfer of materials that would constitute pollutants if discharged to the Newport River either from runoff from the site, through atmospheric dispersion, or from spills.
- o The potential for negative impacts on the tourism sector of the economy would be the highest for those uses that look the most industrial (e.g. tall stacks, large size and bulk, high material stockpiles, etc).
- o The potential for generating increased public revenue is greatest for those activities that are: the most labor intensive and require the largest capital facility investments (capital facilities can be taxed but stockpiled materials cannot).
- o Port related industrial activities do not normally generate any significant increase in the need for public services and facilities.

Environmental Impacts.

As discussed above, the greatest potential for environmental impacts is associated with those port activities that could potentially result in increased discharge of pollutants to the Newport River estuary. These activities are of two types: those involving the handling and transfer of potential pollutants; and those involving the open storage of potential pollutants that could find their way into the estuary either through runoff from the site or through atmospheric dispersion.

Transportation System Impacts.

Current Carteret County Zoning and the proposed "Rural/Port" re-classification would permit non-water dependent industrial development to be located on Radio Island. This would not be a good use of a unique and valuable resource.

As discussed previously, if the developments that have been proposed over the past few years were actually built, over a ten-fold increase in the tonnage moving through the port would be experienced. Almost the entire increase would be in bulk cargo (grain, phosphate, and coal). Neither the existing rail or barge transport systems are suitable for handling increased shipments of this magnitude. Alternative transport systems consisting of a new rail line, a slurry pipeline or some other mode would have to be developed to handle cargo movements of this magnitude.

3. Concentration of Future OCS Related Port Facilities on Radio Island.

As discussed in Chapter III, the Morehead port area will be used as the site for OCS onshore support and service activities during exploratory stage activities. At an April briefing given by Chevron in Morehead City, company officials stated that even if economically recoverable reserves of oil and gas are found off the North Carolina coast it will be about seven (7) years before actual production begins and the oil and/or gas begins to flow into the onshore energy stream. While this is true, it tends to create a false security that there will be plenty of time to make onshore siting decisions after a find is made. This would not be the case. If there is a find, it can reasonably be assumed that available land in the Morehead port area that is capable of supporting either development or production stage activities will be quickly committed.

Exploration will begin within the next year. It would be very beneficial for local officials to decide at an early stage which potential uses would be good to locate in the harbor area and which should be located elsewhere. If there is a find, the ideal scenario for the Morehead port area would be for it to serve as the center of onshore support activities, with the oil and/or gas processing facilities located elsewhere.

The OCS onshore support activities that could potentially be located in the Morehead port area include:

- o Additional temporary onshore service bases.
- o Permanent onshore service bases.
- o A platform installation service base.
- o A pipeline installation service base
- o A temporary pipe coating yard.

Depending on the nature of a find, there could also be a proposal to locate a marine terminal in the port area.

Radio Island possesses all the attributes necessary to make it an excellent location for OCS onshore support activities. Adequate land is potentially available; it has good access to an all-weather channel; and the road and rail systems are very adequate for transporting needed materials to the site.

Following is a discussion of the possible advantages and disadvantages associated with the concentration of future OCS related port activities on Radio Island.

Potential Community Impacts.

Negative community impacts associated with the concentration of OCS support activities on Radio Island would not be expected to be significant. Support materials consisting of mud, cement, pipe and fuel can be transported to the service bases by either road or rail. If rail is utilized, the volumes to be transported would not approach the volumes associated with shipping bulk cargo by rail. Only a total of 11,000 tons of mud, cement and pipe are needed annually for each development drilling rig and this falls to practically nothing during production.

One potentially negative community impact is that housing problems could exist during construction phase activities (if they occurred during summer months). However, this problem would only be temporary in nature.

Local community impacts would consist primarily of increased traffic to and from the site. Visual and aesthetic impacts would not be expected to be significant because the service bases essentially consist of facilities for handling and storing materials and are generally low in height.

Potential Economic Impacts.

OCS service activities tend to be labor intensive. Construction type activities could create a significant

number of temporary jobs. More permanent employment levels will depend on the nature of a find. The total employment (direct and indirect) associated with the operation of a major support base has been estimated to be about 400.

Local marine related businesses that provide repair and support services could also benefit significantly from this type of operation. The local economic impact during exploratory drilling is estimated at between \$1 - 1.5 million annually for each rig serviced. This figure would increase significantly for each development drilling platform serviced.

The positive fiscal impact on local governments could be significant because of the increased taxes resulting from increased employment and local expenditures. However the capital facility investment would probably not be very significant.

Service bases do require more urban type services (primarily water and sewer service) than do other types of activities. However, these services can and should be financed by the developers and users of the service bases through user fees.

Potential Environmental Impacts.

OCS onshore service bases do not typically create environment problems of any significance. However, two potential problems must be addressed.

- o A pipe coating yard uses heavy metals and chemicals during the coating process. Waste disposal and runoff must, therefore, be closely controlled.
- o The development of a marine terminal if economically justified by the nature and magnitude of an oil find could present some potentially significant problems. The harbor area because of its deep channel is the only possible location for a marine terminal in the area. While it already is the location of marine terminal facilities, a marine terminal for receiving offshore oil would present a special problem in that the oil would be transferred to shore by pipeline. The laying of such

a pipeline could present some problems although they would be expected to be temporary in nature. Additionally, there is always the possibility of a spill.

Potential Transportation System Impacts

Concentrating OCS service activities on Radio Island would not be expected to create any transportation problems. The existing systems servicing the Island are adequate for meeting anticipated needs.

OCS service activities would not take full advantage of the deep water channel resource (service vessels require only a 15 to 20 foot channel). However, one other important factor is that all of the onshore service facilities tend to be temporary in nature and little evidence of their existence remains once they have fulfilled their purpose. Activities are reduced significantly once production starts. Thus, OCS onshore support facilities provide excellent interim uses of port area lands because they do not preclude other beneficial longer term uses.

4. Retain "Rural" Land Classification, but Permit Additional Community Type Development.

The Carteret County Land Use Plan currently classifies Radio Island as "Rural", which is defined as land whose highest use is for agriculture, forestry, mining and other low intensity uses. The existing uses on the main body of the Island, which consist of heavy industrial use on the northwest corner and a mixture of light industrial and maritime related commercial uses on the northeast corner, are generally inconsistent with this classification.

One option would be to retain the existing "Rural" classification, but gradually permit more marine related commercial type development in and adjacent to the existing marine commercial development on the eastern side of the Island. This type of development should not be permitted on the western side of the Island which has deep water frontage. It is our judgement that under no

circumstances should commercial or light industrial activities be located on the deep water channel if they would preclude future port oriented development which will require deep water channel access.

Following is a discussion of the potential advantages and disadvantages associated with retaining the "Rural" land classification of the Island.

Potential Community Impacts

There would be no adverse areawide or local community impacts associated with this option because there would likely be little, if any, additional development on the Island, at least in the foreseeable future.

Potential Economic Impacts.

There are numerous potential locations for marine related commercial development in Carteret County. The northeast corner of Radio Island has been available for this type of use for some time, but has experienced only relatively minor development. There is little reason to believe that this situation would change in the near-term. Essentially, no significant economic benefits would likely result from this option except that it would preclude any possibility of detrimental impacts on the commercial fishing and tourism industries that are a possibility with development options that involve more extensive industrial use of Radio Island.

There are five major landowners of the main body of Radio Island. These owners control about 80% of the Island (about 200 acres). Four owners have plans for utilizing their land for port related industrial purposes. Their land ownings comprise about 170 acres. The proposed uses provides an indication of what the best economic use of

the land. Retention of the "Rural" classification from an economic perspective would be inconsistent with market realities. Additionally, a "Rural" classification would not permit the utilization of a natural resource (a deep water channel that can potentially be deepened) that is unique in the State of North Carolina. If the "Rural" classification is retained, it is assumed that it would eventually be changed as economic demands grow. Consequently, this action could be viewed somewhat as a holding tactic (similar to land banking) that could preserve the unique values of Radio Island for future desirable port related development until the transportation access problems can be resolved.

Potential Environmental Impact.

No significant environmental impacts associated with the retention of a "Rural" classification which permits some additional commercial marine type development would be expected.

Potential Transportation System Impacts

No significant transportation impacts associated with the retention of a "Rural" land classification would be expected.

5. Conclusions

- o The best economic use of Radio Island is for port related industrial purposes. The potential for increased jobs and local revenue generation is greatest for this option. This is due primarily to the potential economic benefits associated with the easy access to a deepwater channel. This access should be the prime consideration in assessing future Radio Island development.
- o The potential for adverse community and environmental impacts are also greatest for the Port/Industrial development option. It is expected that environmental problems will be dealt with through State and Federal permit processes. However, local regulations are not currently strong enough to deal with potential community impact problems.

- o Because of potentially adverse community impacts, re-classifying the main body of Radio Island from "Rural" to "Rural/Port" should be done concurrently with the adoption of amendments to the Carteret County Zoning Ordinance.
- o Land uses that are not water-dependent should not be permitted on Radio Island.
- o Projects whose approval would create significant increases in rail traffic through or around Morehead City should not be approved prior to the development of a solution to the identified transportation problems. An alternative would be to grant conditional approval subject to the implementation of a transportation system solution. (this might be necessary in order for the shippers/exporters to execute contractual commitments). However, adequate legal provisions sufficient for halting operations of a project at a given point if the transportation alternative is not developed, must be available.
- o Break bulk and general cargo handling would tend to have a greater local economic impact in terms of job creation than would dry bulk handling because they are less mechanized (in contrast, mechanized operations lower the costs to shippers). The potential for negative community and environmental impacts would also be lower for general cargo operations. However, the existing capacity at the SPA Terminal for accommodating this type of activity is not being approached and there is little indication that this situation will change in the near-term. The potential demand for dry bulk cargo handling (e.g. of grain, phosphates and coal) is far greater and more immediate.
- o Even if the transportation problems associated with significant increases in dry bulk cargo handling can be resolved, there is a need to minimize other potential negative impacts through the establishment of local site plan review requirements which include strong buffering requirements.
- o Even if an alternative rail system to Radio Island is developed, rail problems on Radio Island itself could be a significant problem. For example, the potential use of 6 unit trains per day are associated with only one project. This number could potentially double depending on the type of projects that are located elsewhere on the Island. Radio Island is relatively small and its physical capacity for handling rail traffic of this magnitude must be questioned.

- o The immediate need for utilizing Radio Island for OCS onshore support needs is not currently significant. However, if exploration activity increases or if development activity occurs as a result of a recoverable find, there is no other tract of land in the harbor area as suitable for meeting the increased support needs.
- o Onshore OCS support would be an excellent use of Radio Island. The positive impacts on the local economy could be significant and the potential for significant negative community and environmental impacts would be minimal. Additionally, many of the support uses would be temporary in nature and other longer-term uses of the Island would not be precluded.
- o The southeastern side of Radio Island is currently used for swimming and scuba diving. These uses involve trespassing on private property. Such uses should continue on a long-term basis only if: 1) a tract for a public recreation is acquired and operated by a public agency; and 2) recreation uses are deemed safe after thoroughly assessing problems associated with the sharp depth drop-off; and 3) whether such use is determined to be compatible with boat traffic which uses the Bulkhead channel.

IV. RECOMMENDED AREA DEVELOPMENT PLAN

A. PORT AREA CONCEPT PLAN

Chapter II of this report contains an assessment of existing conditions in the Morehead port/harbor area potentially affecting its future development. Chapter III contains an assessment of port/harbor area development options based on a consideration of community, economic, environmental and transportation factors. Based on the findings and conclusions contained within these two chapters, a port area concept development plan has been prepared.

A primary recommendation is that land areas in the port/harbor area be divided into four land use categories: port; future port; conservation; and public recreation. Each of these uses is discussed below.

1. Port Areas These tracts consist of areas that are already utilized for port related purposes or possess the necessary characteristics and potential for being used for such purposes in the near-term future. Three areas are designated for port use. These are:
 - o SPA Terminal. This property is already largely developed. Vacant areas on the property are programed for near-term port related development.
 - o Radio Island. The main body of Radio Island should be developed for port related purposes. Three types of suitable uses have been identified: a gradual development of port related facilities which require access to the deep-water channel; OCS onshore support facilities as an interim use of land with longer-term port development potential; a continuation of water dependent commercial/light industrial use on the northeast sector of the Island.
 - o Gallant/Beaufort Channel Area. The area between the Beaufort-Morehead City Airport and Gallant/Beaufort Channel has the potential for being developed as the site of onshore support facilities to support offshore OCS exploration activities.

2. Future Port Areas These areas are owned by the SPA and are potentially suitable for future port use but there is no immediate or short-term need for developing them for this purpose. Three land areas in this category have been identified. These are:

- o Marsh Island. Marsh Island should be reserved for future dry bulk handling of commodities reaching the port area by barge.
- o North Radio Island. North Radio Island has long-term potential for port related use associated with the development of Radio Island as a port facility. North Radio Island also could be used as the location of future OCS onshore support facilities if there is a recoverable find of oil and gas reserves.
- o Brandt Island. Because of its location on the deep water channel, Brandt Island has long-term potential for port related use if potential environmental problems can be adequately mitigated. However, the lack of road and rail access limit its port potential. Its best future port use might be as the location of a ship-to-ship storage/transfer facility. The Island would have to be re-classified to Rural/Port if it is to be used for such purposes.

3. Conservation Areas

These lands should be maintained in essentially their natural state because of their fragile nature or because of their value as a wildlife habitat/marine estuarine area. Land areas in this category are:

- o Carrott Island/Town Marsh
- o Radio Island Marsh areas to the northeast of the main body of the Island and across the Causeway.
- o Newport River marshes
- o Bogue Bank marshes
- o Newport River and Bogue Sound Islands not specifically designated in the Carteret County Land Use Plan for other uses.

4. Public Recreation Areas

Two areas that have potential for public recreational use have been identified. These are:

- o North Radio Island Carteret County needs a public boat launching facility. A 1970 study conducted by the U. S. Army Corps of Engineers identified the extreme southwestern corner of North Radio Island as a good location for such a facility and associated parking. Such a use would not preclude longer-term port or maritime commercial use of the Island. Possible acquisition by Carteret County should be explored with the SPA.
- o Southeast Radio Island A strip on the southeastern end of Radio Island is currently used by the public for swimming and scuba diving. Its continued long-term use for these purposes is likely contingent upon it being acquired by a public agency which would require a willingness of the current owners to sell the needed acreage (the relocation of the Main Island access road to the east and conflicts with Bulkhead channel traffic might limit the port potential of the tract); and a determination that this is a safe location for a public recreational facility.

Figure 12 presents a sketch of the overall port area concept plan described in this section.

B. RADIO ISLAND DEVELOPMENT PLAN

As discussed in detail in III-C, the basic recommendation of this study is that the best future overall use of Radio Island is for port related purposes. This section details this recommendation.

1. Recommended Re-Classification

It is recommended that Radio Island be re-classified from "Rural" to "Rural/Port". This classification indicates the prime purpose the land should be used for; it does not indicate specific uses or how those uses could be developed on the Island. Rather, these latter issues should be addressed in the Carteret County Zoning Ordinance. Consequently, it is

recommended that the re-classification of Radio Island to "Rural/Port should occur concurrently with the adoption of amendments to the Carteret County Zoning Ordinance as are outlined in Section 3. Because existing local land use controls are not considered adequate for controlling potential developments in the County's Port Industrial District, reclassifying the Island without amending the zoning ordinance is not recommended.

If the Carteret County Zoning Ordinance is used to both identify and describe how specific uses can be developed in the Port-Industrial District, only a simple definition of the "Rural/Port" classification is needed. The recommended definition for "Rural/Port" is: "The Rural/Port classification is used to identify areas that are appropriate for development for port or water dependent commercial and industrial facilities".

2. Radio Island Development Concept Plan

A development plan for Radio Island must address a number of issues. These include: the types of development that should be permitted; the provision of road and rail access on the Island; the continued use of the Island for public recreation; and spoil disposal. These concerns are addressed in this section.

- a. Land Uses The outstanding attribute of Radio Island is the easy access to the deep-water Morehead City channel from the western side of the Island. Because of this, the western side of the Island should be limited to port related developments that require access to the deep channel. However, because the eastern side of the Island has access only to the 15 foot Bulkhead Channel, other types of water dependent uses should be permitted on this side of the Island. The uses could include:

water dependent commercial and light industrial uses similar to those already existing in this sector; port related uses that require only shallow draft vessels which do not interfere with Bulkhead channel navigation; and marine research activities.

Radio Island would also be an excellent location for onshore facilities that would be developed to support offshore OCS exploration and development stage activities; but not production stage oil or gas processing or refining activities. Using Radio Island for this type of use could result in local economic benefits while not precluding future use of the same lands for port related purposes. The SPA property holdings are potentially an excellent location for onshore support facilities. Such facilities could also be located on other Island tracts that are privately owned.

b. Road and Rail Access

Three roads currently provide the primary access to Radio Island. A road on the western side of the Island provides access to the Aviation Fuels Terminal. A road on the eastern side of the Island provides access to the marine commercial and light industrial facilities located off Bulkhead Channel. The major Island access road, which runs to the LST ramp at the southern end of the Island, is owned by the Department of Defense.

Gulf Interstate has requested that the Department of Defense relocate the access road to the east in order to be able to accommodate the development of a loop rail line on its property. It is expected that this will be accomplished only if the Gulf Interstate project is approved and implemented.

Rail access on the Island is currently available only to the Aviation Fuels Terminal. Gulf Interstate's site development plan includes extending a rail line to its property and then looping it in order to accommodate 100 car coal trains. If export tonnages were to necessitate 6 to 8 unit trains per day, as has been projected, the loop would eventually be utilized constantly. Consequently, while rail access to the Mississippi River Grain Elevator property off this loop would be physically possible, it would be severely limited.

A second loop off the main Island rail line would be needed to serve the SPA's property holdings if heavy volumes of bulk cargo are moved to this site by rail as was initially considered for the AOV project. (a concept sketch showing how these loop rail lines could be developed is shown in Figure 13.) However, the existing rail line to the Aviation Fuels Terminal could be utilized to serve the SPA property if rail usage is not significant.

Rail traffic of the magnitude needed to support port operations associated with coal export operations will necessitate development of an alternative to the current rail line that runs through Morehead City. In fact, coal export projects and other similar projects that rely heavily on rail transport should not be approved in the absence of a solution to the rail problem. However, even if a feasible rail alternative is identified and developed, major rail problems will still likely occur on the Island itself. For example, if both the AOV and Gulf Interstate projects were actually implemented as initially

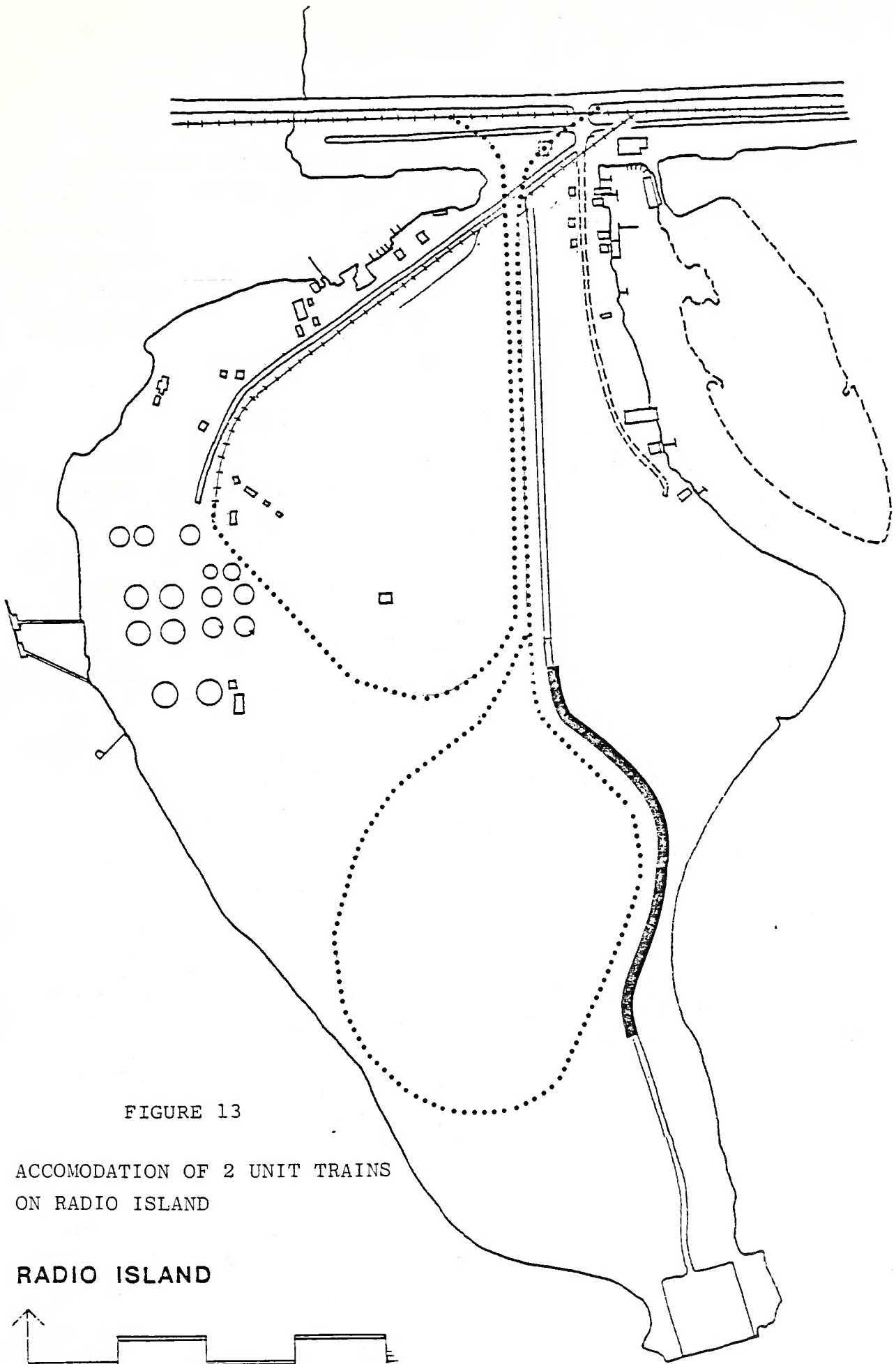
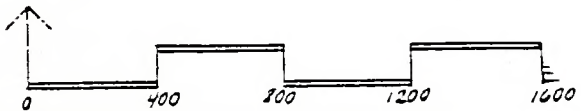


FIGURE 13

ACCOMODATION OF 2 UNIT TRAINS
ON RADIO ISLAND

RADIO ISLAND



proposed, from 12 to 14 unit coal trains per day would eventually make a round trip to and from Radio Island. These train operations when considered along with those to and from the Aviation Fuels Terminal and the Mississippi River Grain Elevator property provide some indication of the magnitude of the potential train movement operations and scheduling problems that might be experienced.

c. Public Recreation

The area on the southeastern end of Radio Island bordering on Bulkhead Channel is currently used by the public for swimming and scuba diving. The land is owned by the U. S. Navy, by Gulf Interstate and by Mississippi River Grain Elevator, Inc.. Continued long-term use of this sector of the Island for public recreation will necessitate public agency acquisition of a strip of land to the east of the access road from Gulf Interstate and/or Mississippi River Grain Elevator.

Gulf Interstate's concept development plan does not indicate any development to the east of the main Island access road. Consequently, this land might be available for acquisition. However, Mississippi River Grain Elevator's plans include the possibility of using the Bulkhead Channel side of its property for a barge docking facility. This use would present an obstacle to acquiring the land.

Even if it is possible to acquire the needed land for a beach facility and associated parking, a determination will first have to be made as to whether a public beach can be operated safely at this location because of the steep drop off in depth close to the shore and the

possible hazards associated with boat traffic using Bulkhead Channel.

d. Spoil Disposal

The Corps of Engineers has recently utilized Gulf Interstate's Radio Island property for the disposal of spoil from Bulkhead Channel maintenance dredging operations. However, the Corps' temporary easement has now expired. Additionally, Corps personnel consider that Radio Island has probably reached its effective limit as a spoil disposal location. A comprehensive harbor area spoil disposal study is needed to identify future spoil disposal sites for all harbor and channel maintenance operations.

Figure 14 depicts the recommended concept plan for future Radio Island development based on the factors and considerations discussed above.

3. Needed Local Development Controls

Radio Island is zoned "Port Industrial" in the Carteret County Zoning Ordinance. Forty-two (42) different uses are permitted in a "Port Industrial" district. Almost any type of industrial use is permitted. There is no requirement that these uses be water dependent. Site plan reviews are not required for projects in this classification and buffering requirements are inadequate. It is our judgement that these deficiencies should be corrected as is outlined below.

- a. Permitted Uses The prime criteria should be that a use permitted in a "Port Industrial" District be water dependent. A second criteria should be that only those water dependent uses that would 1) be of small scale, and 2) be expected to have minimal community and environmental impacts, be permitted as uses of right.

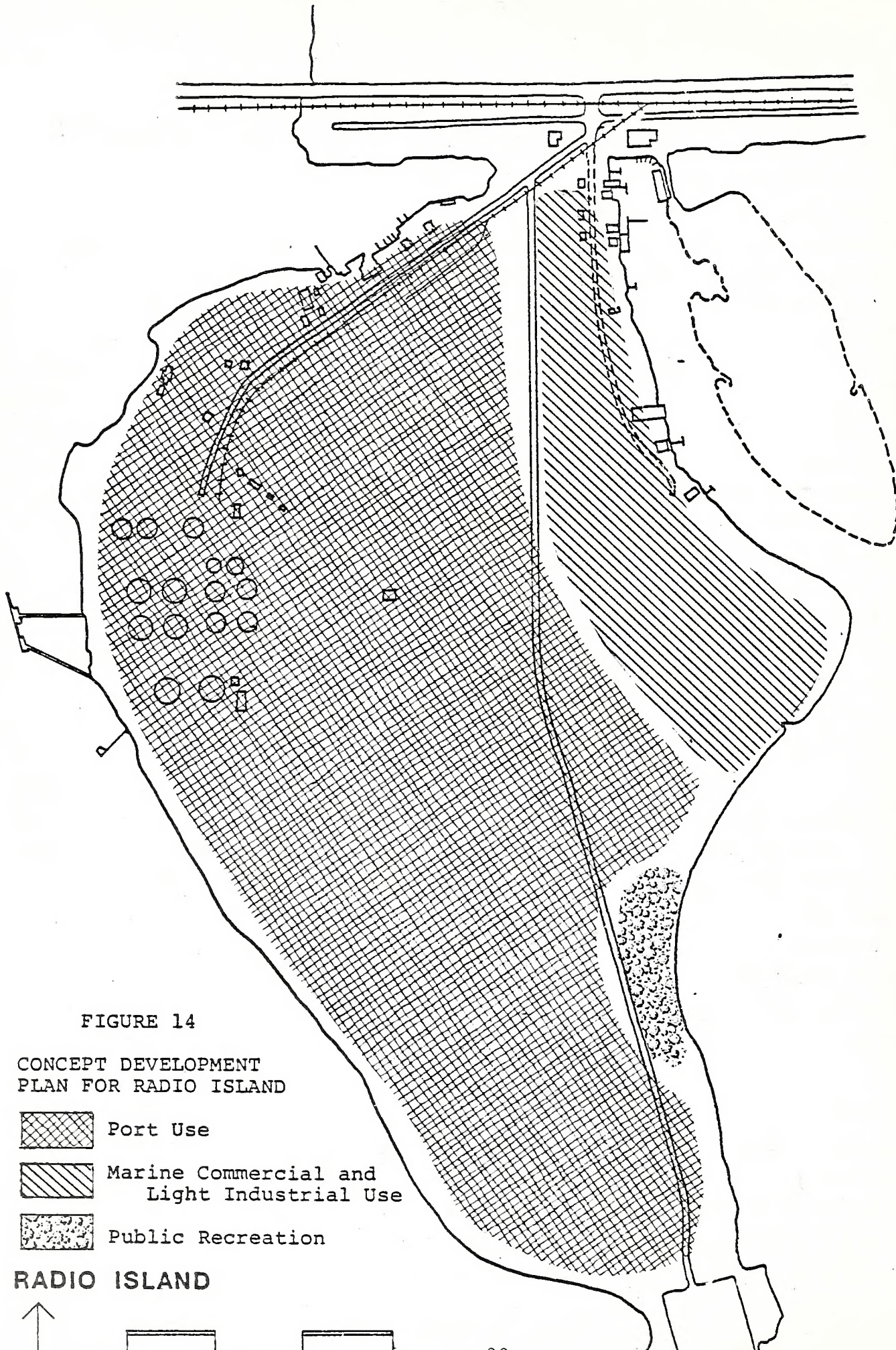





FIGURE 14

CONCEPT DEVELOPMENT
PLAN FOR RADIO ISLAND

-  Port Use
-  Marine Commercial and
Light Industrial Use
-  Public Recreation

RADIO ISLAND



Uses that could result in potentially significant community impacts should be permitted only as special exception uses and would require that detailed analyses be undertaken prior to the issuance of a special use permit.

The location of Radio Island is sensitive with respect to protection of the Newport River estuary and with respect to the community impacts that increased rail traffic associated with Island development could have on Morehead City. Consequently, it is essential that any use that could potentially impact either of these areas be assessed in detail under the special use permit requirements that should be established for the Port Industrial District. To accomplish this, it is recommended that a special use permit be required for any use that is either:

- o 5 acres or larger in size; or
- o would upon full development result in more than two rail trips per day (one round trip).

A recommended list of permitted uses for the Port Industrial District of the Carteret County Zoning Ordinance is shown below.

- o accessory uses and buildings;
- o marine railroad yards;
- o marine research facilities;
- o OCS temporary onshore service bases;
- o OCS permanent onshore service bases;
- o OCS platform installation service bases;
- o OCS pipeline installation bases;
- o OCS temporary pipe coating yards;
- o piers, wharves, docks and deep water berth facilities for cargo shipment;
- o piers, wharves and dock facilities for commercial fishing and marine research vessels;

- o railroad facilities;
- o seafood processing, handling and storage facilities;
- o ship repair, excluding lay-up storage
- o storage and handling facilities for dry bulk commodities;
- o storage and handling facilities for liquid bulk commodities;
- o utility facilities; and
- o warehousing and handling facilities for general cargo.

All of the above uses should be permitted as a use of right except if the size of the project exceeds 5 acres or if in implementing the project rail traffic would increase by more than one round trip per day to and from the Port Industrial District.

b. Special Use Permit Requirements

North Carolina statutes authorize County Zoning Boards of Adjustment or Boards of County Commissioners to issue special use permits and to impose reasonable and appropriate conditions and safeguards upon the permits.

The special use permit appears to be an appropriate tool for analyzing and controlling both on-site and off-site impacts associated with potential Radio Island development projects.

Application prerequisites for a special use permit in the Carteret County Port Industrial District should include:

- o Submission of a site development plan which includes on-site runoff control, a utility plan, and a rail and road access plan.
- o A description of the screening and buffering techniques that will be employed (possible buffering and screening techniques are described in Section C).

- o A description of the road, rail and/or waterborne access plans for bringing commodities to and from the site.

The Carteret County Board of Commissioners should assume the responsibility for issuing special use permits for the Port Industrial District. Approval requirements should include:

- o Recommendations from the Carteret County Planning Commission.
- o Findings based on analyses conducted by the County Planning Department that the project:
 - Will not increase rail traffic through Morehead City to the extent that the cumulative number of trains going through Morehead City each day exceeds 6 (3 round trips);
 - Is consistent with the Carteret County Land Use Plan (the Plan should include a policy that only port uses requiring access to the deep water channel should be permitted on the western side of Radio Island);
 - Site plan has been reviewed and approved by all appropriate governmental agencies;
 - Buffering plan is adequate for protecting abutting or adjoining property; and
 - Access plans will not have significant adverse impacts on either the surrounding communities or on the carrying capacity of the Intracoastal waterway.

The Carteret County Zoning Ordinance gives the Board of Commissioners ample authority for imposing any additional restrictions, standards and requirements it deems appropriate as a condition for project approval. Additionally, the Board of Commissioners possesses adequate authority for revoking a special use permit if the conditions of the permit (e.g. the obtaining of all required Federal and State permits) are not being adhered to.

An additional tool available to Carteret County that could be used in conjunction with the use of a special use permit process is the authority the County possesses for requiring a local environmental impact statement for significant development projects.

For example, an ordinance could be passed by the County requiring the preparation by a developer of a detailed community impact assessment if the County Planning Department's preliminary investigation of a project raises significant concerns and issues that should be addressed in greater detail. The approval of the impact assessment by the Board of County Commissioners could be made a condition for special permit issuance by the Board. The use of a local environmental impact statement should be written to cover all significant development projects in the County and not just to those located in the Port Industrial District.

C. BUFFERING PORT-INDUSTRIAL LAND USES ON RADIO ISLAND

Port industrial development on Radio Island should be buffered because of its exposed location in the Newport River estuary, closely flanked by Morehead City, Beaufort, and Bogue Banks. Buffers are needed (1) to diminish the visual impact of port development within the area in order to protect the tourism values of the area; and (2) to reduce the wind-transportation of particulate matter. The latter applies particularly to coal and phosphate.

1. Visual Buffers Even with buffers, port-industrial development on Radio Island depending on its nature, could be visible throughout the area. Tall vertical elements (e.g. 40-60 foot high piles of coal) would be prominent on the horizon of this flat coastal landscape. Radio Island development will extend the industrial character already established by the existing port terminal. Nevertheless, negative views from certain key vantage locations can be mitigated through buffering techniques. These

key vantage locations are identified on Figure 15 and discussed below.

a. View from Route 70 between Morehead City and Radio Island.

The view of Radio Island from this vantage point is through the industrial development of the existing port. With such a dominant foreground, there is no feasible way to hide this land use character. Visual enhancement of this industrial landscape, however, can be accomplished by plantings along the right-of-way.

b. View from Route 70 between Beaufort and Radio Island

Coming from the context of historic Beaufort, development on Radio Island will have a negative visual impact. This can best be offset by a well-designed planting buffer on the south side of the highway and railway. The strategy here is to control negative views of Radio Island by dominating the foreground. This approach would produce a parkway quality. To do otherwise would be ineffective.

c. View from Beaufort Waterfront.

Port development, especially tall elements on the southern half of Radio Island, will dominate the horizon from the Beaufort waterfront. Pivers Island acts as a partial screen. It could be a more effective screen, if belts of trees were planted in vacant areas within the sight lines from Beaufort. Secondly, a belt of trees should be planted along the southern half of the eastern shore of Radio Island. While not completely masking tall elements, it would create a strong green edge and buffer along the

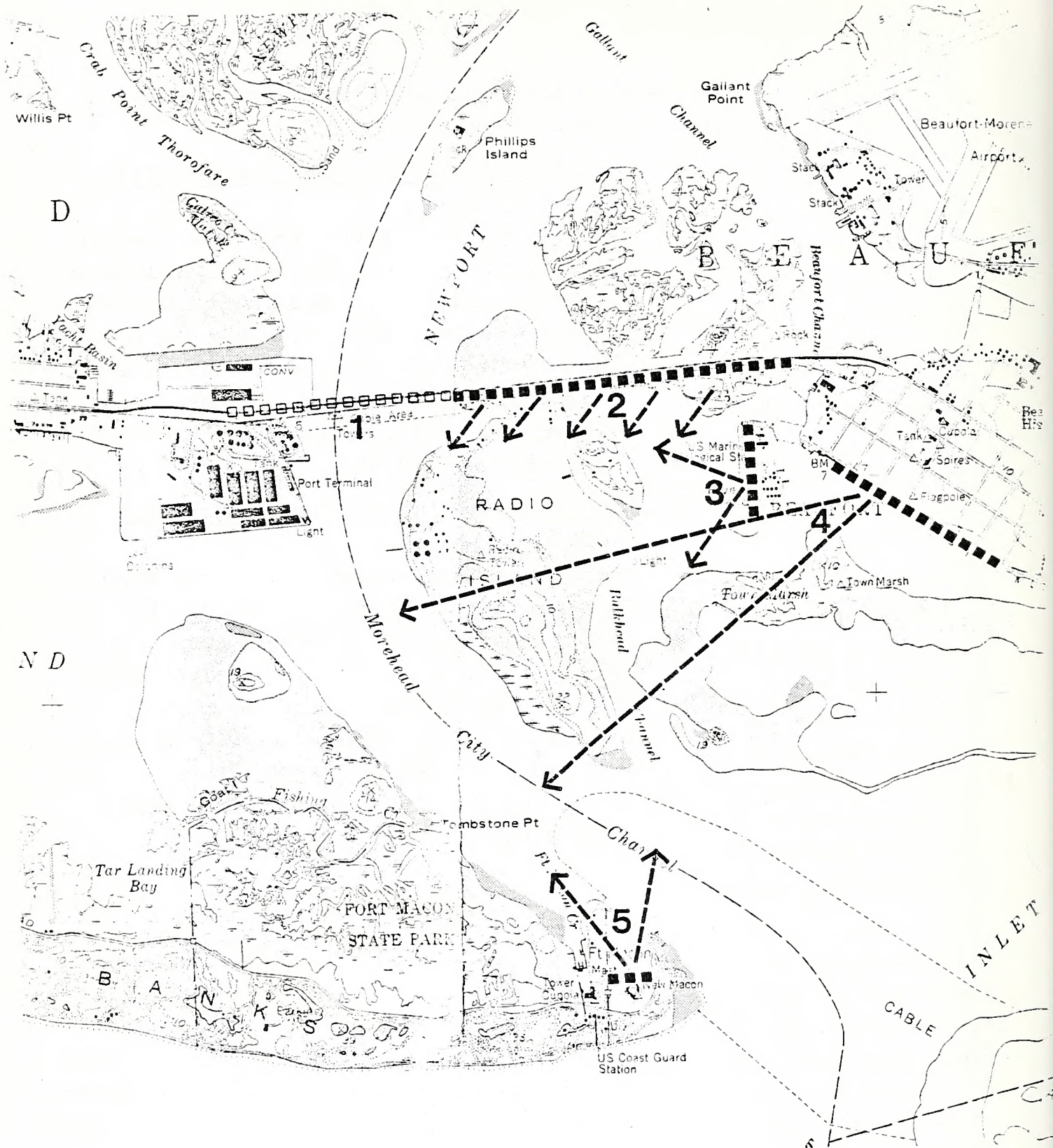


FIGURE 15

VISUAL IMPACT OF RADIO ISLAND

Key:

- Critical Vantage Locations
- Less Critical Vantage Location
- - - Sight lines

water as a foreground to industrial elements. Such a belt of trees would also serve to insulate a public beach area on the eastern shore of Radio Island from adjacent industry.

d. View from Pivers Island

With wide open exposure to Radio Island, the most effective buffers here would be along the eastern side of Radio Island, as well as carefully considered foreground plantings on Pivers Island itself.

e. View from Fort Macon State Park

Port development will be easily visible from the eastern end of Bogue Banks. Views from here are to the shipping channel side of Radio Island, where complete buffering is not feasible, due to the basic need for wharf access. East-west belts of trees across Radio Island every 1000 feet or so would give an overall "green" context to the industrial development rising above it. Once again, from this vantage point, an effective control can be achieved in the foreground of the viewer--on Bogue Banks.

f. Public Beach Area on Eastern Side of Radio Island

A minimum 100 foot wide belt of trees should be planted between the beach area and industrial development.

2. Wind Buffers Surrounding any use involving the stockpiling and transferring of unconsolidated particulate matter, carefully designed shelterbelts should be planted. These should minimize wind transportation of material. Configuration, width, and density of shelterbelts must be calculated on the basis of wind speeds and directions, and the nature of the stockpiled material.

Creating visual and wind buffers should be an active consideration in the development of industrial uses on Radio Island. Site plan review should require demonstration that adequate measures are being taken on-site to mitigate adverse effects. Additionally, a program could be investigated whereby Radio Island developers could contribute to a fund which would be used for the implementation of buffering strategies off of the island. As identified above, these off-Island approaches are often the most effective way of handling negative visual impacts. For best results, on-island and off-island approaches should be used in concert.

D. LOCAL COORDINATING MECHANISMS.

As discussed throughout this report, the possibility exists that the Morehead port area could become a center for onshore OCS support activities. If this occurs, there will be a need for local governmental agencies in the area to discuss and negotiate locational and siting decisions with the oil and gas development companies on a continuing basis. It is recommended that a local Task Force be created to carry out this effort. This Task Force should include representatives of:

- o Carteret County
- o Atlantic Beach
- o Beaufort
- o Morehead City
- o Carteret County Board of Education
- o State Ports Authority
- o Carteret County Economic Development Council

The Task Force should be assigned a number of specific responsibilities, including:

- o To collectively represent its member agencies during all negotiations with the oil and gas companies.

- o To receive periodic progress reports from the oil and gas companies.
- o To disseminate information on a regular basis (perhaps in the form of a quarterly status report) to member agencies and to other concerned governmental and private interests. The Task Force would serve as a local clearinghouse for information related to oil and gas exploration and development.
- o To review proposals to locate onshore facilities in Carteret County and to select sites for any future support and production facilities that might be needed.
- o To consider who should provide the necessary support services to the oil and gas companies and how they should be financed.
- o To develop regulatory controls that could be used by the member agencies to help insure that potentially adverse impacts are alleviated.

To carry out these responsibilities, an industry proposing to locate an OCS facility in Carteret County should be required to submit a detailed description of the facility and of the service needs associated with the project to the Task Force. This submittal should include:

- o Locational requirements - acreage, accessibility requirements (road and rail connections) and needs associated with water dependency.
- o Specific service needs - primarily water, sewer, waste disposal and energy needs. These needs should be quantified.
- o Timing requirements - a proposed schedule for bringing the project into operation, including dates by which various public facilities and services are needed.
- o A description of the employment associated with both the construction of the facility (temporary employment) and the operation of the facility (permanent employment), and an estimate of how many workers will be brought in from outside the Carteret County area on both a temporary and permanent basis.



If such a Task Force is created and becomes operational, local officials will be in an excellent position to effectively address the issues that will quickly face the region if there is a discovery of economically recoverable oil and/or gas reserves.

RAIL COORDINATION

In addition to a mechanism for coordination of OCS onshore activities, it is recommended that Carteret County and the towns of Beaufort and Morehead City establish a rail traffic coordinating committee comprised of representatives from each respective Planning Board. The objectives of the Committee would be to insure that a comprehensive approach for addressing potential rail traffic problems is taken; and to insure that cumulative multi-jurisdictional impacts are considered in reaching local decisions on development proposals that involve increased rail operations.

CEIP Publications

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2. P. D. Cribbins. A Study of OCS Onshore Support Bases and Coal Export Terminals. CEIP Report #2. September 1981. \$10.
3. Tschetter, P. D., M. Fisch, and R. D. Latta. An Assessment of Potential Impacts of Energy-Related Transportation Developments on North Carolina's Coastal Zone. CEIP Report #3. July 1981. \$10.
4. Cribbins, P. S. An Analysis of State and Federal Policies Affecting Major Energy Projects in North Carolina's Coastal Zone. CEIP Report #4. September 1981. \$10.
5. Brower, David, W. D. McElyea, D. R. Godschalk, and N. D. Lofaro. Outer Continental Shelf Development and the North Carolina Coast: A Guide for Local Planners. CEIP Report #5. August 1981. \$10.
6. Rogers, Golden and Halpern, Inc., and Engineers for Energy and the Environment, Inc. Mitigating the Impacts of Energy Facilities: A Local Air Quality Program for the Wilmington, N.C. Area. CEIP Report #6. September 1981. \$10.
7. Richardson, C. J. (editor). Pocosin Wetlands: an Integrated Analysis of Coastal Plain Freshwater Bogs in North Carolina. Stroudsburg (Pa): Hutchinson Ross. 364 pp. \$25. Available from School of Forestry, Duke University, Durham, N. C. 27709. (This proceedings volume is for a conference partially funded by N. C. CEIP. It replaces the N. C. Peat Sourcebook in this publication list.)
8. McDonald, C. B., and A. M. Ash. Natural Areas Inventory of Tyrrell County, N. C. CEIP Report #8. October 1981. \$10 for all requests.
9. Fussell, J., and E. J. Wilson. Natural Areas Inventory of Carteret County, N. C. CEIP Report #9. October 1981. \$10 for all requests.
10. Nyfong, T. D. Natural Areas Inventory of Brunswick County, N. C. CEIP Report #10. October 1981. \$10 for all requests.
11. Leonard, S. W., and R. J. Davis. Natural Areas Inventory for Pender County, N. C. CEIP Report #11. October 1981. \$10 for all requests.
12. Cribbins, Paul D., and Latta, R. Daniel. Coastal Energy Transportation Study: Alternative Technologies for Transporting and Handling Export Coal. CEIP Report #12. January 1982. \$10 for all requests.
19. Pate, Preston P., and Jones, Robert. Effects of Upland Drainage on Estuarine Nursery Areas of Pamlico Sound, North Carolina, N. C. CEIP Report #19. December, 1981. \$1.00.

